Product Engineering

McGRAW-HILL MAGAZINE OF DESIGN
RESEARCH AND DEVELOPMENT

1958 INDEX

PART II — VOLUME 29

WEEKLY EDITIONS • JULY 7 to DECEMBER 29

Subject index • page 2
Author index • page 15
Company names and organizations • page 10

Index includes editorial content of each weekly issue:
Feature articles and special reports, staff and contributed,
Developments to Watch, Perspectives, Editorials, Product Designs,
Significant Parts, Trends in Appearance Design,
Design Roundups, Reference Book Sheets, Tangents, and featured items in
Engineering Week, Points of View, and Abstracts.

Copyright 1958 by McGraw-Hill Publishing Co., Inc., 330 West 42nd Street, New York 36, N.Y.

— A —

Actuators
Estimations of resonant frequency of hydraulic actuators. B. C. Moore (DD) ..... Mid-Sept. J5
Thermal actuator (SP) ..... Nov. 3 33

Adhesives
Bonds of over 500 psi possible (SP) July 28 34
Dry adhesive wear (A) ..... Oct. 27 100
Dry-bonding adhesive (SP) ..... Dec. 1 31
Epoxy adhesive for preforms (SP) Sept. 8 36
Friction-material adhesives (SP) Oct. 27 69
How to calculate stresses in adhesive joints. H. A. Perry ..... July 7 64
Lower-cost, weatherproof adhesives (D) July 28 5
Rubber-based adhesives can be made stronger (D) ..... Dec. 29 28
Water-thinned contact cement (SP) Sept. 29 59

Aeronautics
Air computer navigation system (N) Dec. 8 42
Aircraft efficiency program studied for wider engineering use (N) ..... Nov. 10 41
Airlift may compete with surface transport (N) ..... Aug. 4 25
Airplane seats with service facilities built into the backs (PD) ..... Sept. 15 88
All-floated gimbal rate gyro (N) Sept. 29 22
Army's new Doak 16 VTOL aircraft (N) ..... Nov. 17 19
Atmosphere entry simulator (N) Aug. 11 22
Bellwether with wings—report. E. J. Tangerman ..... July 7 52-57
Bombsight for the B-70 (N) ..... Nov. 17 26
British slash weight, size of aviation equipment (N) ..... Sept. 22 21
CAA air traffic control plan gets first computer (N) ..... Sept. 29 25
CAL building test apparatus for small rotorcraft, may replace costly wind tunnels (N) ..... Nov. 10 40
Cancellation of Canada's Arrow seen as jolt to future R&D (N) ..... Oct. 27 22
Cast urethane rubber for F4D-1 tail wheels (N) ..... Nov. 24 23
The complexity barrier (A) ..... Sept. 15 149
Ejection seat for the X-15 (N) ..... Nov. 3 19
F-104 gets infrared fire control system (N) ..... Sept. 22 32
Improved atmospheric equipment needed for manned space flight (N) Oct. 13 41
Jet passes vertical flight test (N) Nov. 17 19
Landing gear door for F-89—casting saves $530 (N) ..... Oct. 27 24
LOX converter for B-52 (N) ..... Sept. 1 24
New copter tail rotor has variable speed (N) ..... Oct. 20 18
Parachute—Army QM Engineers design fast-opening parachute (N) Sept. 22 24
Planemakers cut engine outlet, inlet noise (N) ..... Oct. 6 18
Pneumatic de-icing system (D) ..... Aug. 18 17
Prop-jet executive transport (N) Sept. 8 24
Reactor miniaturization and mechanization may lead to aircraft propulsion (D) ..... Oct. 20 5
Sabrejet trainer (N) ..... Nov. 24 25
Simulated helicopter with real rotors and controls (PD) ..... July 21 71
'68-model copters may carry 100 tons (N) ..... July 21 19
Standardization of support equipment urged (N) ..... Oct. 27 22
Supersonic wind tunnel using hot water (N) ..... Sept. 22 29
3-D radar has no moving scanner (N) Oct. 27 24
Titanium for efficient use in fighter aircraft by spotwelding in composite construction (N) ..... Oct. 6 16
VTOS, STOL—planes without fields (N) Dec. 15 17
Vulcan aircraft cannon (N) ..... Nov. 3 17

Aluminum
Chevrolet switching to aluminum engines? Here are the clues ..... Sept. 8 19
First all-aluminum railway refrigerator car (N) ..... Nov. 24 25
Foamed aluminum (D) ..... July 21 17
High strength of aluminum alloy. A. B. DeRoss (DD) ..... Mid-Sept. B6
Manganese joins aluminum to give strong stainless. Ham & Cairns Jr. Dec. 22 50
More aluminum from new reduction plant (D) ..... July 28 5
New aluminum alloys and fabrication methods (D) ..... Aug. 11 8
Why not an all-aluminum car? .. Dec. 1 20

Amplifiers, Electronic
Amplifiers need near-absolute-zero temperatures (N) ..... Dec. 15 10
Transistorized amplifier turns out 45 volts (D) ..... Nov. 3 8

Appliances
First models of electronic refrigerator (D) ..... Oct. 6 5
How Moscow designs — special issue — Appliances for sale at GUM .. July 14 29
Mixed-flow impeller for air conditioner (N) ..... Dec. 8 43
Push-button iron (N) ..... Dec. 29 26
Refrigerator-freezer combination features thermal insulation twice as efficient (D) ..... Aug. 11 5
Sales looking up (D) ..... Sept. 22 5

Applied Mechanics
Calculation of sheave diameters for v-drives knowing center distance (DD) Mid-Sept. E9
Cantilever springs that roll with the load. J. D. Howell ..... July 7 58
Chart analyzes sinusoidal motion. Dr. K. W. Maier (RS) ..... Nov. 24 77
Conjugate-beam method. E. D. Clark (RS) ..... Aug. 18 83
Conveyor rolls—how to design for drive or drag. L. H. Austin ..... Sept. 15 78
How many planets in an epicyclic gear? R. J. Willis Jr. ..... Nov. 24 57
How to calculate stresses in adhesive joints. H. A. Perry ..... July 7 64
How to calculate stresses in press-fit bushings. E. H. Schuette (RS) .. Sept. 1 51
How to figure deflections of elastically supported cantilever beams. T. F. Callahan (RS) ..... Aug. 4 63
Correction ..... Sept. 15 40
How to find the diameter for true involute form. E. A. Niemann (RS) Oct. 27 65
How to predict efficiency of gear trains. E. E. Shipley ..... Aug. 4 44
Method of finite differences. Shaffer & Krause ..... Oct. 13 77
7 closer looks at metal properties. Edward Loria ..... Oct. 27 48
Spring clutches — whip the backlash. Joseph Kaplan ..... Aug. 18 62
Springs that store energy best. Dr. K. W. Maier ..... Nov. 10 71
Stress in flat-ended pressure cylinders. E. J. Cattabiani (RS) ..... Dec. 8 111
Swivel joints—charts find torque, pressure loss. G. M. Bagnard (RS) .. Dec. 22 67
Tap the reserve strength in metal parts. D. J. Graziano ..... Sept. 29 44

Assembly
Stacking the components simplifies assembly (PD) ..... Dec. 8 94

Automotive
Auto mufflers redesigned for stainless steel (D) ..... Nov. 3 5
Auto sales looking up (D) .... Sept. 22 5
Automated test stand replaces on-the-road driving (N) ..... Aug. 4 25
Balanced program for improving drivers, roads and autos recommended (N) ..... Dec. 8 43
British go Italian in car styling (N) Nov. 24 26
Buick Electra (N) ..... Sept. 29 24
Carmakers seek answer to high tool cost—building-block techniques (N) July 28 19
Cars that need no grease may be around in 3 to 5 years (D) .... Dec. 1 5
Checker's Superba to bow in January (N) ..... Nov. 24 25
Chevrolet's Impala sport sedan (N) Oct. 13 41
Chevrolet—Let's see what's new with Chevy (PD) ..... Oct. 27 58
Chevrolet switching to aluminum engines? Here are the clues (N) .. Sept. 8 19
Chrysler putting swivel chairs in cars (N) ..... Sept. 8 23
Dashboard lighting by a new route (D) Aug. 18 17
Delivery truck with rollaway front end (N) ..... Nov. 17 19
Delrin—new plastic for instrument panels? (N) ..... Nov. 3 12
Dodge Royal Lancer (N) ..... Oct. 13 39
Eight design authorities ... evaluate '59 cars ..... Dec. 1 26
Electric passenger car (N) ..... Nov. 24 27
Electronic rearview mirror (N) .. Sept. 22 33
Gears provide knuckle power for truck's front-wheel drive (PD) Dec. 22 55
GM's 1959 Cadillac coupe (N) .. Sept. 29 24
GM plans aluminum engines, lighter cars (N) ..... Oct. 20 17
Higher compression ratios may increase nothing but customer complaints (D) Sept. 29 19
How foreign car design has changed since 1950 (N) ..... July 7 19
How Moscow designs — special issue — The largest auto plant does its own design ..... July 14 44
Hydro-pneumatic suspension and "new concept in fuel injection" (D) .. July 21 18
Improve fifth wheel (N) ..... Sept. 1 21
Italian sports car with trim 88-lb plastic body (N) ..... Oct. 13 38
It's already 1959 in Detroit—engineering changes in the new Chryslers, Pontiacs, Cadillacs (PD) ..... Oct. 13 80
Magnesium makers eye car market (N) Nov. 10 39
More external use of plastics on cars (N) ..... Dec. 8 42
Moscow's bus built like ours (PD) Aug. 4 48
New day arriving in U S car design (N) Sept. 29 26
1959 Pontiac Bonneville Safari station wagon (N) ..... Oct. 6 15
Open-back panel truck (T) ..... Nov. 3 29
Polyester glass moldings form body of Gran Tourisme coupe (N) ..... July 7 21
Rambler custom sedan (N) ..... Sept. 29 24
Renault with a Gia body (N) ... Nov. 3 18
Safety gets big investment from carmakers (N) ..... Oct. 6 15
Sandhopter car (D) ..... Dec. 1 8
Small car designed in Holland (D) Oct. 20 8
Studebaker's Lark — first design look (N) ..... Nov. 10 37
Swiss figure out car parking—autosilo (N) ..... July 21 19
Trucks switch to ac-dc system (N) July 7 23
Unimog—truck sprouts power take-offs (PD) ..... Aug. 18 64
USSR car industry lists new models (N) Aug. 11 27
Volkswagen formula: improve parts but keep same model (N) ..... Dec. 1 17
Why not an all-aluminum car? .. Dec. 1 20

— B —

Batteries
Battery carries its own built-in heater (D) ..... July 7 17
Battery-operated train tested in Scotland (N) ..... Aug. 11 21
Car battery of new design (D) .. Sept. 15 35
New thermal batteries (D) ..... Dec. 8 38
Photochemical storage batteries (D) Nov. 24 22
Thermoelectric generator with nuclear-battery heat source (D) ..... Aug. 11 5

Bearings
Ball and roller bearing lubrication (A) Nov. 10 153
Bearing heat and dissipation charts. H. W. Hamm (DD) ..... Mid-Sept. F10
Flat air bearings (A) ..... Nov. 10 153
14 special-purpose bearings. Federico Strasser (DR) ..... Oct. 13 96
How much stress in a bearing ball? J. E. Ruzicka (RS) ..... Nv. 10 97
Iron powder metal bearings (SP) Nov. 17 41
Nonmagnetic bearing (SP) ..... Sept. 8 36
Plastics as solid lubricants and bearings (A) ..... Aug. 18 116
Self-lubricating bearings (SP) ... Dec.15 35
Sintered bronze bearing (SP) ... Oct. 6 35
Sleeve bearing life (A) ..... Nov. 10 149
Step bearing, a new concept in air lubrication. C. R. Adams ..... Dec. 1 96
Three-lobe bearing (A) ..... Oct. 27 100
Thrust-radial bearing (SP) ..... Sept. 8 36
World's largest ball bearing (N) Dec. 22 24

Belt Drives
Dacron will be standard reinforcement in V-belts (D) ..... Dec. 29 27
Design of belt and wire rope drives. G. H. Ryder (DD) ..... Mid-Sept. E10
Flat belts for adjustable-pitch pulleys. R. G. Prouty ..... Oct. 27 59
Miniature gear belts (SP) ..... July 7 81
New belting for mechanical drives and conveyors (D) ..... Oct. 13 35
Plastic-core leather belting (DD) Mid-Sept. E14
Quadruple reduction drive (SP) .. Aug. 18 87

Bonding
Copper strip, edge-bonded to steel (D) Aug. 25 5
Graphite bonding (D) ..... Sept. 15 35

Brakes, Electrical
Far-reaching changes in brake design (D) ..... Oct. 13 36
Performance standard for brake linings (D) ..... Sept. 15 36

Brakes, Mechanical
Aircraft brake system to save weight, wear (N) ..... Aug. 11 20
Far-reaching changes in brake design (D) ..... Oct. 13 36
Liquid-cooled brakes to meet vehicle demands (D) ..... Nov. 17 5
Performance standard for brake linings (D) ..... Sept. 15 36
Pontiac—bigger brakes in new model (PD) ..... Oct. 13 80
Truck-brakes — better design sought (N) ..... July 21 21

Brazing
One temperature for successive brazes. Cremer & Mueller ..... Dec. 8 84

(A) Abstract. (D) Developments. (DD) Design Digest. (DS) Design Roundup. (Ed) Editorials.
(N) Technical News. (P) Persnective. (PD) Product Design. (PV) Points of View.
(RS) Reference Book Sheets. (SP) Significant Parts. (T) Trends in Appearance Design.

—C—

Cams
Cams drive steel-squeezing dies (PD) Dec. 8 95

Capacitors
Capacitors for the 900-F range (D) Nov. 24 22

Casting
Best recipe for casting urethane foam. Harry Gerstin....Nov. 10 86
Casting for landing gear door for F-89 saves $530 (N)....Oct. 27 24
Injection casting (D)....Oct. 13 36
Molybdenum that is workable as-cast (D)....Sept. 22 5
Nickel alloy castings for 1800 to 2300 F (SP)....Dec. 29 31
Pearlitic malleable castings. O. K. Hunsaker (DD)....Mid-Sept. D7
Polystyrene models speed design tests for investment casting (N)..Sept. 1 22
Slip casting...its field broadens. L. M. Schifferli Jr....Oct. 13 84
Tinned castings by "direct-chloride" process (N)....Dec. 1 12
USSR gains in vibration casting (N) July 21 23
Vacuum gives top-quality metals. L. W. Johnson....Aug. 18 72

Ceramics
Air Force Falcon has ceramic nose cone (D)....Oct. 6 7
Ceramic sponges to sop up wastes (N) Dec. 15 10
Ceramics swaged to shape and metal clad (D)....Dec. 1 5
Custom-tailored ceramics (D)...Dec. 8 37
Ductile ceramics (SP)....Aug. 11 37
Glass and ceramic fibers—they beat the heat. T. D. Callinan....July 7 70
New way to metallize ceramics (D) Dec. 15 8
"Temperit", new ceramic resists chemical, thermal shock (N)....Aug. 4 24

Clutches, Mechanical
Applications of sprag-type clutches. W. T. Cherry (DD)....Mid-Sept. E18
Inverted lever operates spring-loaded clutch assemblies (SP)....Oct. 6 35
Multiple-plate clutches (SP)....Nov. 24 81
Wet and dry clutches (A)....Nov. 10 149
Whip the backlash in spring clutches. Joseph Kaplan....Aug. 18 62

Color
Automatic color control (SP)...Nov. 3 33

Compressors
Coiling the cooler saves water (PD) Dec. 22 54
Packaged air starts turbines (PD) July 21 70
Plastic piston rings for nonlubricated applications. Taber & Robbins (DD) Mid-Sept. F7
Selection and application of heavy-duty air compressors. R. Schaefer (DD) Mid-Sept. J12

Computers
Air computer navigation system (N) Dec. 8 42
CAA air traffic control plan gets first computer (N)....Sept. 29 25
British computer has 20 million character storage (N)....Oct. 20 22
Computers permit new statistical analysis concepts to aid design (N) Sept. 8 21
Computers speed design of high-frequency equipment (N)....Sept. 1 25
Data processors weighing only 175 lb. (D)....Dec. 8 38
First mobile digital computer (N) Aug. 18 20
Numerical control. Rosenblatt & Dutcher....Oct. 27 50
Numerical control and the design engineer. H. J. Langlie....Oct. 20 23
Pulse-counting comparator controls table movement (N)....Dec. 15 18
Red China joins USSR to pioneer new automation techniques (N)..Nov. 24 23
Report Poland's first computer (N) Nov. 10 39
Simplified computer circuits (D) Sept. 29 19
Small computer leads copter to, from target (N)....Oct. 27 23
Talking machines (D)....July 7 18

Control Systems
Control panel speeds foreman too (PD) Aug. 4 49
Lubrication alarm system (SP).Sept. 29 59
Machine-tool designers announce new control developments (N)....Oct. 27 25
Magnetic control component (SP) Nov. 3 33
Monitoring system for controlling dangerous gases (D)....Oct. 13 36
Numerical control. Rosenblatt & Dutcher....Oct. 27 50
Numerical control and the design engineer. H. J. Langlie....Oct. 20 23
Push-rod speed control (SP)...Sept. 15 105
Selector-switch knobs. G. A. Peters Dec. 8 103
Stop-light stopper is the latest traffic control gadget (D)....Dec. 29 28
Temperature control (SP)....Dec. 1 31
Understanding automatic control (A) Oct. 27 100

Control Systems, Hydraulic
Fluid power for machine-tool controls. F. D. Yeaple Jr....Aug. 18 70
Remote-control slave unit (SP).Oct. 13 103

Corrosion
Corrosion rate of wrought iron (DD) Mid-Sept. B5
Corrosion-testing methods (A)..Oct. 13 143
High alloys to combat corrosion. E. D. Weisert (DD)....Mid-Sept. B16
Rust preventives (A)....Oct. 27 100
Rust preventives from rice oil (D) Dec. 22 22
Stress corrosion in metals. Dr. E. H. Phelps....Aug. 4 56
Thin metal films as corrosion indicators (D)....Dec. 22 22
What's your rust index? — Corrosion map of the United States (N).Sept. 1 25

Couplings
Limited end float couplings for motor applications. Mills & Petermann (DD) Mid-Sept. E6
Miniature flexible coupling (SP)..Dec. 29 30
Operating principles of fluid couplings. O. K. Kelley (DD)....Mid-Sept. E15
Quick-disconnect coupling (SP)..Oct. 6 35
Self-welding couplings (D)....Nov. 17 8
10 universal shaft-couplings. Federico Strasser (DR)....Aug. 18 80
13 ways to couple shafts. Federico Strasser (DR)....Aug. 4 60

Cylinders
Curves find bending and torsion strength of thin-walled cylinders. Irene Kusmiss (RS)....July 21 85
Curves find compression strength of thin-walled cylinders. Irene Kusmiss (RS)....July 7 77
Hydraulic cylinder stroke controlled hydraulically (SP)....Dec. 22 71

—D—

Design
Air Force Material Chief, Lt. Gen. Irvine, blasts prototypes and other production delays (N)....Aug. 4 21
Ammonia fumes in the print room banished with new setup. Haakon Johnson....July 21 74
Automobile—It's already 1959 in Detroit —engineering changes in the new Chryslers, Pontiacs, Cadillacs (PD) Oct. 13 80
Blueprint specifications for cleanliness (D)....Sept. 15 35
Building-block techniques reduce model-change costs for carmakers (N) July 28 19
The case for swaging. L. A. Whiting Nov. 24 70
Computers permit new statistical analysis concepts to aid design (N) Sept. 8 21
Conveyor rolls—how to design for drive or drag. L. H. Austin....Sept. 15 78
Darers go first (Ed)....Aug. 11 17
Debugging—that last step in design. D. C. Cumming....Sept. 15 92
Design apologies (Ed)....Sept. 15 73
Design of experiments. E. R. Schwarz Sept. 22 34
Design producibility (A)....Dec. 8 149
Designing the experiment (A).Dec. 22 86
East is east (Ed)....Sept. 22 19
Engineering design — the background and basis of contemporary life. Hugh Clausen....Sept. 1 38
14 adjusting devices. Federico Strasser (DR)....Oct. 27 62
14 indexing devices. Federico Strasser (DR)....Sept. 1 48
Has foreign competition affected the design of your products? (PV) July 28 32
How many planets in an epicyclic gear? R. J. Willis Jr....Nov. 24 57
How Moscow Designs—special issue July 14
Because we need to know....July 14 2
First, the frame of reference, Moscow today....July 14 5
How new industrial equipment is developed....July 14 13
Prices? Selling? Redesign? Service? July 14 21
What Soviet industry and people can buy....July 14 26
Appliances for sale at GUM..July 14 29
For the newest equipment, the Industrial Exhibition....July 14 30
The Academy of Sciences tops all techniques....July 14 38
Moscow University is the USSR's largest....July 14 40
The largest auto plant does its own design....July 14 44
The Soviet engineer and his rewards July 14 50
Publisher's Postscript: it belongs to You....July 14 56
If you visit the USSR on business July 14 57
Is design just gadgetry? (Ed)..Nov. 24 51
Japan: the design competitor with problems (P)....Sept. 1 29
Linkage joints. Ho Chow....Dec. 8 87
Measurements methods retard U S design progress (N)....July 28 22
Medaris says missile designers need new training (N)....Sept. 29 24
Molecular engineering offers new design concepts (N)....Aug. 25 10
Money-saving electromagnetic relays. Ralph Probert....Nov. 24 66
Motors — Guide to selecting polyphase motors. C. C. Libby....Aug. 18 58
Navy develops propeller for super-speed craft (N)....Sept. 15 41
Non-clogging centrifugal pumps. T. Ygge....Nov. 10 78
Numerical control and the design engineer. H. J. Langlie....Oct. 20 23
Optical elements based on spherical aberration (D)....Oct. 6 8
Packed glands for high pressure. J. L. Thomson (DR)....Nov. 10 94
Nov. 24 74
Passport to tomorrow's new products—a study of R&D departments in eight companies—their problems and solutions. F. R. Park....Dec. 29 5
Salaried industrial designer and his work — Robert Heymen of Newark Laboratory (T)....Dec. 15 30
Selector-switch knobs. G. A. Peters Dec. 8 103
Servo design in chemical industry (N) July 21 23
'Shame Show' indicts Japanese design pirates (N)....July 21 20
Shipbuilding program poses design problems (N)....Aug. 18 23
Springs that store energy best. Dr. K. W. Maier....Nov. 10 71
Step bearing...a new concept in air lubrication. C. R. Adams....Dec. 8 96
Submarine tanker design stepped up by Britain (N)....Sept. 1 25
Supersonic wind tunnel using hot water (N)....Sept. 22 29
Swivel joints design. G. M. Bazzard Dec. 8 100
13 handy lever mechanisms. Federico Strasser (DR)....Sept. 15 98
Today's plowshares: bigger, more versatile (N)....Aug. 11 19
Torpedo launcher (PD)....Nov. 10 80
Underwater cargo vessel (N)...Sept. 29 22
Weather reporter goes into orbit (PD) Oct. 27 56
What you should know about designing for reliability. Dr. D. N. Chorafas Nov. 10 76
Wire inserts. H. W. Crane (RS).Sept. 29 55

Design see also **Industrial Design**

Differential
Method of finite differences. Shaffer & Krause....Oct. 13 77

Drafting
Combined techniques cut drafting time, tedium (N)....Dec. 22 25
Design it in 3-D. H. J. Reinig..Aug. 25 22
Drafting standard—projections (DD) Mid-Sept. All
Engineering design—the background and basis of contemporary life. Hugh Clausen....Sept. 1 38
For today's draftsman, these modern tools—Plan '59. Nicholas Chironis Oct. 13 68
Microfilm pushes drawings aside. W. J. Locke....Oct. 27 44
Plan for efficiency with modern drafting equipment—Plan '59....Oct. 6 28

—E—

Economics
Capital spending by manufacturers on the rise—finally (N)....Sept. 22 24
Capital spending levels out; manufacturers' 1959-60 plans are 3% below 1957 levels (N)....Nov. 17 17
Case Institute plans research guide (N) Nov. 24 24
Controversial renegotiation act (D) Nov. 17 7
Foreign countries move slowly toward more R&D spending (N)....Aug. 18 19
German machine tools: still climbing (P)....Dec. 22 43
Industries review R&D spending (N) Nov. 24 25
Plan '59
Why modernize?—report
Research and development — how much should you spend?..Oct. 6 23

(A) Abstract. (D) Developments. (DD) Design Digest. (DS) Design Roundup. (Ed) Editorials.
(N) Technical News. (P) Perspective. (PD) Product Design. (PV) Points of View.
(RS) Reference Book Sheets. (SP) Significant Parts. (T) Trends in Appearance Design.

Is your engineering laboratory still in the race?....Oct. 6 26
Plan for efficiency with modern drafting equipment....Oct. 6 28
Company libraries stretch R & D funds....Oct. 6 30
Model shop saves development time....Oct. 6 32
6-state science money goes mostly to research and development (N)....Sept. 22 23
Snafu may be normal (Ed)....Sept. 8 17
Technical trade with Russia (P).Dec. 8 81
USSR reaches production goals; doubled capital output seen by 1965 (N)....Dec. 15 19

Editorials
The "boss" is gone....Dec. 8 83
Chief salesman?....Oct. 20 13
Darers go first....Aug. 11 17
Design apologies....Sept. 15 73
A dog-gone mouse....Aug. 18 57
East is east....Sept. 22 19
Engineer's catechism....July 28 17
Figures don't lie...or do they?.Nov. 10 69
How to modernize engineering..Oct. 13 65
Industry of discovery....July 21 61
Is design just gadgetry?....Nov. 24 51
'Let the thousands of flowers of thought bloom...'....Dec. 15 15
Merry Christmas....Dec. 22 45
Passport to tomorrow...a study of R&D techniques....Dec. 29 2
Plan '59—Why modernize engineering? Oct. 6 21
Recipathy....Nov. 3 15
Safety doesn't sell....Nov. 17 15
Snafu may be normal....Sept. 8 17
Standardized brain?....Sept. 1 31
The thrust of curiosity....Oct. 27 43
What's Black Magic?....Aug. 25 13
What would we do with a VOICE? Aug. 4 37
Who's out of step?....Sept. 29 33

Education
"The crowd cheered Barabbas..." (Ed) Dec. 1 15
Education worries Soviets too (N) Sept. 1 21
French science students strike for more space (N)....Dec. 29 26
How Moscow design — special issue — Moscow University is the USSR's largest....July 14 40
IEE reports foreign student exchange on the rise (N)....Dec. 8 41
Khrushchev shakes up USSR education system (N)....Oct. 27 21
NATO's Science Committee agrees on fellowship program (N)....Dec. 8 42
Next redesign project?...engineering curricula....Nov. 17 35
Paid leave for advanced study? (PV) Sept. 8 32
Paris engineers study nucleonics at night (N)....Sept. 29 26
USSR engineer education keyed to Soviet needs (N)....Dec. 29 25
U S, USSR agree on science student exchange (N)....Dec. 8 41

Electrical
Battery-operated train tested in Scotland (N)....Aug. 11 21
Characteristics of commercially available servo modulators. Barber & Klivvans (DD)....Mid-Sept. I10
Contact-free variable resistors (D) Nov. 24 21
Copper foil for electrical use is laminated on kraft paper and creped (D) Dec. 29 27
Dashboard lighting by a new route (D) Aug. 18 17
Electric buses, trucks driven by high frequency field (N)....Dec. 29 26
Electric passenger car (N)....Nov. 24 27
Electroluminescence — new area-source of light. A. R. Gardner....Sept. 15 74
Electromagnetic refrigeration (D) Dec. 15 5
Electrostatic separator for materials discrimination (D)....Dec. 29 27
Fuel-cell research for hydrogen-oxygen dc power (N)....Nov. 3 10
Guide to reactor ratings (N)....Oct. 20 10
Heat to electricity with semiconductors —report from Soviet (D)....Sept. 8 8
Indicator light rotates (SP)....Dec. 8 115
Light catches glassware defects (PD) Sept. 1 43
Light replaces heating instrument (PD) Nov. 24 62
Luminescence—a glossary of terms (N) Nov. 3 10
Modular terminal block (SP)....Dec. 1 30
Molybdenum supports for semiconductors (N)....Aug. 11 12
Phosphors and semiconductors affected by pressure (N)....Aug. 11 10
Plasma thermocouple promises economical energy conversion (N)...Dec. 1 10
Progress in heat-to-electricity conversion (D)....July 21 17
Radio-frequency power used to mine rock (D)....Dec. 15 8
Removable connectors shown to be reliable (N)....Oct. 27 22
Stereo hearing aid (D)....Dec. 15 8
Thermoelectric devices used as heat pumps (D)....Sept. 22 5
Thermoelectric generator with nuclear-battery heat source (D)....Aug. 11 5
Tiny flashlight with recharging device (N)....Nov. 10 38
Types and uses of thermistors (DD) Mid-Sept. I16
Wire harnesses made from plastic coils (D)....Sept. 8 8

Electronics
Ballot tabulator (D)....July 7 18
Design better hi-temp coils for electronics (N)....Sept. 15 42
Develop high accuracy electronic commutator (N)....Aug. 11 28
EIA cuts its readings, Dallas confab data-filled (N)....Dec. 22 27
Electroluminescence—a new area-source of light. A. R. Gardner....Sept. 15 74
Electronic finger checks drills (PD) Aug. 4 46
Electronic rearview mirror (N).Sept. 22 33
First models of electronic refrigerator (D)....Oct. 6 5
Flexible terminal blocks (SP)..July 28 34
High-speed teleprinter (D)....Dec. 8 38
"One-shot, disposable" electronic equipment (D)....July 21 17
Semiconductor device — major breakthrough in electronic amplification (D)....July 21 18
Single unit displays 0-to-9 (SP)..Nov. 17 41
Sort peas, beans, nuts by color electronically (N)....Aug. 25 20
Tube-tester (D)....Aug. 4 19
Voice-actuated equipment (D)...Oct. 6 8

Electroplating
Electroplated coatings under test at Bell Labs (D)....Nov. 17 5
For better electroplating. P. C. Noy (DR)....July 7 74

Engineering Administration
Are you creative?—ask your wife. Dr. J. H. McPherson....Nov. 17 28
The "boss" is gone (Ed)....Dec. 8 83
Build a model shop—Plan '59. W. E. Boggs....Oct. 13 74
Chief salesman? (Ed)....Oct. 20 13
Court to engineer: "Keep ex-employer's secrets" (N)....Aug. 18 22
"The crowd cheered Barabbas..." (Ed) Dec. 1 15
Engineer education keyed to Soviet needs (N)....Dec. 29 25
Engineer-retention (A)....Aug. 4 90
Engineering design — the background and basis of contemporary life. Hugh Clausen....Sept. 1 38
Engineering graduates pay up (N) Aug. 11 22
Engineering inn Europe...a quick look. E. J. Tangerman....Sept. 1 32
Engineer's catechism (Ed)....July 28 17
Engineers importance rises with need for reliable components (N)..Aug. 11 22
How Moscow designs — special issue — The Soviet engineer and his rewards July 14 50
How to modrnize engineering (Ed) Oct. 13 65
How to read heat transfer in Russian (A)....Oct. 13 145
Industrial report preparation and evaluation. C. L. Tutt Jr. (DD) Mid-Sept. A2
Industry again cries engineering shortage (N)....Nov. 3 17
Inventions and patterns (A)....Dec. 22 86
Is your engineering laboratory still in the race?—Plan '59....Oct. 6 26
Medaris says missile designers need new training (N)....Sept. 29 24
Military career for design engineers (P) Sept. 29 31
Money, glamor, challenge decide today's engineer student on future (N) Sept. 15 37
Next redesign project?...Engineering curricula....Nov. 17 35
Numerical control and the design engineer. H. J. Langlie....Oct. 20 23
Optical projectors for engineering, research, development. Jack Stolp (DD) Mid-Sept. A5
Overtime pay for engineers? R. D. Stevens....July 28 29
Paid leave for advanced study? (PV) Sept. 8 32
Paris engineers study nucleonics at night (N)....Sept. 29 26
Plan '59 — Why modernize engineering? (Ed)....Oct. 6 21
Public hero? (Ed)....July 7 51
Publicize the engineer?—Yes, but how? (N)....Dec. 8 39
Recipathy (Ed)....Nov. 3 15
"Reporting Through the Looking Glass" (A)....July 21 118
Reservoir of women engineers in U S virtually untapped (N)....Sept. 8 19
Science-attache appointments to foreign countries (D)....Nov. 17 7
Science-oriented engineers (P)...Nov. 24 49
U S clears definition of technician (N) Oct. 13 39
U S to raise OEEC ante for more engineers (N)....Nov. 10 40
What is the proper balance between government and commercial work within a company? (PV)....Aug. 25 28
What's Black Magic? (Ed)....Aug. 25 13
What would we do with a VOICE? (Ed)....Aug. 4 37
What you need for a better engineering laboratory—Plan '59. R. W. Carson Oct. 13 66
Who's out of step? (Ed)....Sept. 29 33

Engines and Engine Control
Chevrolet switching to aluminum engines? Here are the clues (N).Sept. 8 19
Defense Dept. seeks engine to power heavier satellite (N)....Nov. 24 25
Diesel engine fuel economy. J. C. Miller (DD)....Mid-Sept. H9
Engine exhaust system noise control. D. G. Thomas (DD)....Mid-Sept. H14
Engine tranquillized by torsion bars (PD)....July 7 62
GM predicts aluminum engines, lighter cars (N)....Oct. 20 17
Higher compression ratios may increase nothing but customer complaints (D) Sept. 29 19
Hydraulic fluids and engine oils (D) Nov. 3 5
Multifuel engine: developments here and abroad (N)....Nov. 3 18
New engine governor designed in England (D)....Sept. 29 19
Octane requirements can be held down by proper choice of engine oil (D) Aug. 4 19
Planemakers cut engine outlet, inlet noise (N)....Oct. 6 18
Rumble in single-cylinder engines. J. A. Robinson & others (DD)...Mid-Sept. H2
Second engine for cars to power accessories (D)....Oct. 6 5
Single-stage compressor gas turbine (N) July 28 21
Small gas turbine. Hans Ziebarth.Aug. 4 38
Space-ship engine (N)....Sept. 15 37
Supercharger gives peak power at right time (PD)....Oct. 13 82
Transistorized, low-voltage ignition systems (D)....Dec. 22 22

Europe
Engineering in Europe...a quick look. E. J. Tangerman....Sept. 1 32

Extruding
Lower-cost extrusions promised for aluminum (D)....Dec. 29 28

— F —

Fastening
ASTM and SAE grade markings for steel bolts (DD)....Mid-Sept. G17
Compression fastener and bushing (SP) Oct. 13 103
Fastenings (A)....Dec. 22 86
Load in screw threads (A)....Aug. 18 116
Locking ability of hexagon locknuts (DD)....Mid-Sept. G6
More work for the busy staple. H. G. Allen (DR)....Dec. 8 108
Sealant for threaded fasteners (DD) Mid-Sept. G7
Specifications for nuts (A)....Oct. 27 100
Structural fastener (SP)....Sept. 22 42
20 simple locking devices. Federico Strasser (DR)....Dec. 22 64
Vibration-resistant fastener (SP) Nov. 24 81

Filters
Disposable filter cartridge (SP)..Dec. 1 30
Filter elements at ½ the cost (D) Sept. 22 8
Porous-metal filter elements (SP) Nov. 17 40
Quick-coupling fine filters (SP).Nov. 24 81
Sonic vibrating filter requires less power (N)....Sept. 22 22

Finishes, Chemical
Abrasion resistance—new test (N) July 21 23
Clear anodize for magnesium (SP) Nov. 24 81
Coating permits machining (SP).Nov. 3 33
Coatings to protect molybdenum and columbium (N)....Oct. 20 11
High-temperature paint (SP)..Dec. 22 71
Metal alloy finish (SP)....Oct. 20 30
Nickel-chromium coatings can protect molybdenum (D)....Dec. 22 22
One-coat organic finish (SP)....Sept. 1 55
Photochemical windshields (D).Dec. 1 5
Preservatives or "built-in germ killers" (D)....July 21 18
Sheet-iron coating to replace paper and enamel insulation (D).....Dec. 1 8
Thixotropic corrosion-inhibiting coating, better than 3 coats of paint (D) July 28 8
Tougher coatings that dry faster, based on tung oil (D)....Oct. 20 5
Waxes from sugar cane (D)....Sept. 1 20

Finishes, Mechanical
Deposit any element on a cold base for inexpensive coating (D).....Aug. 25 5
Localized solder coating in printed circuits (SP)....Oct. 20 30
Right finishes for stainless steel. R. E. Paret (RS)....Oct. 13 99

(A) Abstract. (D) Developments. (DD) Design Digest. (DS) Design Roundup. (Ed) Editorials. (N) Technical News. (P) Perspective. (PD) Product Design. (PV) Points of View. (RS) Reference Book Sheets. (SP) Significant Parts. (T) Trends in Appearance Design.

Finishes, Plastic
Abrasion protection for glass (D) Aug. 18 18
Acrylic-lacquer car paint is longer lasting (N) Sept. 15 37
Anticorrosive coatings for metal parts (D) Sept. 29 20
Chromium-silicon films — resistive elements of new design (D) Sept. 15 26
Coatings that will insulate electrical wire (D) Nov. 10 35
Conductive and resistive coatings. R. J. Phair (DD) Mid-Sept. D8
Developments in porcelain enamel coatings (DD) Mid-Sept. C2
Hard, flexible vinyl finish (SP) Nov. 10 101
More carbide coatings (D) Oct. 27 19
New look in porcelain enamel. W. E. Pierce Nov. 24 53
Non-slip epoxy coating (SP) Dec. 15 35
Organic finishes (A) Nov. 10 149
Pigments protect products from heat, light, ozone (N) Oct. 20 11
Silicon-carbide coating for graphite (D) Sept. 15 35
Vinyl wrinkle finish (SP) Dec. 1 31

Finishing
Metal-ceramic coating process (D) July 28 5
More carbide coatings (D) Oct. 27 19
New look in porcelain enamel. W. E. Pierce Nov. 24 53
Plasma arc process (D) Nov. 24 22

Fittings
Swivel joints. G. M. Bagnard
Swivel joints may work where nothing else can Aug. 4 40
Designing with swivel joints Dec. 8 100
Swivel joints — charts find torque pressure loss (RS) Dec. 22 67

Fluid Mechanics
Fluid power for machine-tool controls. F. D. Yeaple Jr. Aug. 18 70
NFPA group meets (N) Nov. 17 26
Trouble shooting fluid circuits (DD) Mid-Sept. J15

Fluids
Hydraulic fluids for continuous service (D) Sept. 22 5
Hydraulic fluids and engine oils (D) Nov. 3 5
Liquid structure based on the molecular theories (N) Sept. 8 10
Silicate esters as functional and lubricating fluids (A) Sept. 15 149

Forming
Forming plastic sheet (DD) Mid-Sept. D4
Forming titanium extrusions. I. J. Wilson (DD) Mid-Sept. D2
Gas-ram machine opens new fields for metal forming (N) Nov. 10 38
Plastics: where vacuum forming stands today. R. L. Daggett Dec. 22 56
Precision compression forming (DD) Mid-Sept. D14

Fuel
Better gasolines (D) July 21 18
Design changes in pumps, valves foreshadowed by changes in aircraft fuels (D) Nov. 24 21
Fuel-cell research for hydrogen-oxygen dc power (N) Nov. 3 10
"New concept in fuel injection" (D) July 21 18
Photon rockets for space ships? (N) Aug. 11 10

— G —

Gaskets
Effects of medium on materials (DD) Mid-Sept. C8
Flange design and gasket selection. E. M. Smoley (DD) Mid-Sept. F2

Gear Drives
Cushioned gear drives (A) Nov. 10 149

Gears
Gear failures related to lubricants. E. E. Shipley (DD) Mid-Sept. E2
Gear hobber (T) Nov. 17 38
Gears provide knuckle power for front-end drive (PD) Dec. 22 55
How many planets in an epicyclic gear? R. J. Willis Jr. Nov. 24 57
How to find the diameter for true involute form. E. A. Niemann (RS) Oct. 27 65
How to predict efficiency of gear trains. E. E. Shipley Aug. 4 44
How to replace gears by linkages (A) Aug. 4 90
Loading of spur gear teeth (A) Aug. 4 90
Mechanism of gear lubrication (A) Oct. 27 100
New standards for gears span wide range of quality. L. D. Martin Dec. 22 46
Total composite error and position error in gears (A) Dec. 8 147

Generators
Air turbines and generators (D) Oct. 27 20
Cast rotor simplifies generator (PD) Sept. 1 42
Thermoelectric generator with nuclear-battery heat source (D) Aug. 11 5

Glass
Abrasion protection for glass (D) Aug. 18 18
Glass and ceramic fibers — they beat the heat. T. D. Callinan July 7 70
What makes glass? a new theory of glass structure (N) Nov. 17 10
Windshield de-icer has transparent film of gold (D) Dec. 1 8

Government
ARPA projects stress science for defense (N) Dec. 1 19
Administration won't change limited war general warfare stand (D) Nov. 17 7
Aid to small business emphasized by Congress (D) Sept. 22 7
Air Force Advisory Board recommends clearer industry policies (D) July 28 7
Air Force "make or buy" contract clauses on the way (D) Dec. 15 7
Air Force Material Chief, Ltd. Gen. Irvine blasts prototypes and other production delays (N) Aug. 4 21
Air pollution controls offer design opportunity (D) Dec. 15 7
Allowable costs for defense contracts to get new rules Jan. 1 (D) Nov. 17 7
Armed forces have 82 technical problems (D) Dec. 1 7
Better high-speed missile target sought by Navy AF (D) Nov. 3 7
By-passing small firms deplored (N) Aug. 25 19
Congress approves $510,000 for Russian translations (D) Aug. 11 7
Congress will take look at status of nation's missile program (D) Dec. 1 7
Controversial renegotiation act (D) Nov. 17 7
Defense contractors granted "proprietary rights" protection (D) Oct. 20 7
Design patent applications to get faster action (D) Nov. 3 7
Federal $1,000-scholarships, loans (D) Aug. 25 6
Federal scholarships questioned by expert (N) July 28 21
Freight rates cut fight (N) Nov. 3 7
Government, prime contractors show subcontracting opportunities (N) July 7 22
Jenkins-Keogh bill—house passed tax bill aids consultants (N) Aug. 18 19
Justice Dept. acts to protect defense contractors (D) Aug. 25 6
Keeping track of information (P) Aug. 18 55
Look for Congress to revamp patent provisions (D) Dec. 1 7
Materials data to come from International Atomic Conference (D) Aug. 25 8
Missile reliability "predicted, assessed, measured, and controlled" (D) Aug. 11 7
NASA piles up space projects totaling $343 million (N) Aug. 25 15
NASA sets technical committees (N) Dec. 15 19
Navy plans satellite launch from aircraft (D) Aug. 25 6
Navy to go underwater in next ten years (D) July 28 7
NSIA previews government product procurement law (N) Oct. 6 18
New satellite program scheduled (N) Dec. 15 23
New space agency takes over from NACA on Oct. 1 (D) Oct. 6 7
New weapon reliability studied by House (D) Aug. 11 7
Nuclear-powered submarines—Down to the sea (P) Oct. 13 59
Pentagon budget squeezing planned for next year (D) Sept. 22 7
Pentagon will lump all weapon development as R&D (D) Dec. 15 7
R&D flexibility sought by GE executive (N) Aug. 11 28
Research activities of the federal government (D) Dec. 1 7
Rival weapons projects—technical evaluation or politics? (N) Oct. 20 15
Salt water goes fresh as pilot plants test conversion theories (N) Oct. 13 39
Science-attache appointments to foreign countries (D) Nov. 17 7
Sea water conversion to get more funds (D) Aug. 25 6
6-state science money goes mostly to research and development (N) Sept. 22 23
Small Business to get easy government capital (D) Oct. 20 7
Space Agency funds cut by Congress (D) Sept. 8 7
USSR technical journel abstracts available (N) Aug. 18 22
U S Atomic Industry plan for making nuclear power economical in U S by 1970 (D) Sept. 8 7
U S must up R&D pace—Gavin (N) Sept. 29 21
WESCON panel session—military, civilians in heated debate on weapons system control (N) Sept. 15 38
What is the proper balance between government and commercial work within a company? (PV) Aug. 25 28
Who will control U S space program? (N) Oct. 27 25

Graphical Techniques
Cantilever springs that roll with the load. J. D. Howell July 7 58
Curves find bending and torsion strength of thin-walled cylinders. Irene Kusmins (RS) July 21 85
Curves find compression strength of thin-walled cylinders. Irene Kusmins (RS) July 7 77
More surface polishing...less galling. W. H. Moore Nov. 24 63
Roberts' Law helps you find alternate four-bar linkages. R. T. Hinkle Oct. 27 54
Tap the reserve strength in metal parts. D. J. Graziano Sept. 29 44

Gravity Research
Antimatter—what it is and how it may be used (N) July 28 10
Design for gravity control — an essay contest (N) Sept. 22 10
A dog-gone mouse (Ed) Aug. 18 57
Future power sources from free radicals (D) Aug. 11 5
Manned space vehicle awaits better instrumentation (N) Nov. 17 21
Maser does electronic job for astronomy (N) Sept. 15 39
New satellite program scheduled (N) Dec. 15 23
Nuclear energy needed for moon trip (N) Oct. 20 10
Packaged laboratories for environmental testing (N) July 28 10
Space rudder uses liquid-filled hoops (N) Dec. 15 10
Weather reporter goes into orbit (PD) Oct. 27 56

— H —

Human Engineering
Dummy endures 4000-psf windblast (N) Nov. 24 28

— I —

Industrial Design
ASID annual meeting — Industrial designers have more than work cut out for them (N) Nov. 3 20
Air conditioning — chilled-water, fan-coil systems offer low-cost route to central air conditioning (D) Sept. 29 20
Air-hydraulic unit (SP) Nov. 17 40
Air nozzle for oil-burning equipment (D) Nov. 10 35
Airline reservation EDPM (T) Sept. 22 36
Airplane seats with service facilities built into the backs (PD) Sept. 15 88
Anchor—French design (T) Sept. 8 34
Bakery operation—twister-molder-panner supplies baking oven (PD) Sept. 15 91
Braille—need equipment for rapid reproduction of braille (N) Dec. 29 25
Carpet sweeper—Swedish-designed (T) Nov. 3 29
Coils—design better hi-temp coils for electronics (N) Sept. 15 42
Controlled heat—a new gas-oxygen lab burner (N) Oct. 6 10
Designing a product—then and now. Spilman & Kolb (T) Oct. 20 26
Dials, and scales, self-illuminating (SP) Oct. 20 30
Dome-shaped building (T) Sept. 22 37
Drill, hand—from France (T) Sept. 8 34
Elevator without cables (N) Dec. 22 25
Fan—new design (D) Sept. 15 36
Firefighter, portable (N) Dec. 8 39
Flat-bed truck (T) Aug. 11 34
French design. Jacques Vienot Sept. 8 34
German designs of construction equipment, machine tools and consumer goods (T) Nov. 17 38
Handle design is getting a lot of attention (D) Aug. 11 8
Has foreign competition affected the design of your products? (PV) July 28 32
Heat exchanger improved with paper-thin stainless (PD) Oct. 13 83
Heat sealer, bench-size (D) Dec. 15 8
Hydraulic fenders for ships (N) Sept. 15 39
"Hydro-wheel"—pump powers truck wheel (PD) Nov. 10 83
Impeller, mixed-flow for air conditioner (N) Dec. 8 43
Impeller takes less power (SP) Sept. 29 59
Industrial air conditioning—what users think of it (D) Sept. 8 5
Industrial designer calls for do-it-yourself market research (N) Nov. 24 24
Japan plans electric train (N) Aug. 11 27
Joints, lightweight rotation (SP) Dec. 22 71
Lock, tubular friction (SP) Nov. 3 32
Low-capacity load cells (SP) Aug. 25 30
Machine tools—large-size machine tools to make thin-section parts for aircraft and missiles (T) Aug. 25 26
New cutting tools accelerate machine tool R&D (N) Aug. 4 23
Nonmetal flexible heating element (D) Aug. 11 8
Nut, self-locking clinching (SP) Oct. 20 30
Office duplicator, portable (D) Nov. 17 8

(A) Abstract. (D) Developments. (DD) Design Digest. (DS) Design Roundup. (Ed) Editorials.
(N) Technical News. (P) Perspective. (PD) Product Design. (PV) Points of View.
(RS) Reference Book Sheets. (SP) Significant Parts. (T) Trends in Appearance Design.

One motor can take the place of two or more with new scissors design (D) Oct. 6 8
Ore crusher from France (T)..Sept. 8 35
Paper shredder, bench-size (D)..Dec. 15 8
Plastic-film dust boot (SP)....Oct. 27 69
Pneumatic clamp for machine tools (D) Aug. 18 17
Power screwdriver (T).....Aug. 25 26
Power vacuum sweeper (T)....Aug. 11 34
Preassembled spring washers (SP) Aug. 25 30
Printing system using photosensitized plastic plates (D).....Aug. 18 18
Propeller—Navy develops propeller for super-speed craft (N).....Sept. 15 41
Quarter-turn connects terminal block (SP) .....Oct. 20 30
Railway refrigerator car, all-aluminum (N) .....Nov. 24 25
Ratchet-drive rotary solenoid (SP) Oct. 13 103
Refrigeration—progress in magnetic refrigeration (D).....Dec. 15 5
Router (T).....Sept. 22 36
Scale gages to hundred-thousandths (PD) .....Aug. 18 67
Screw, burr-free (SP).....Dec. 29 31
Screws—high-strength plastic screws (SP) .....July 28 35
Self-contained hydraulic power package (SP).....Oct. 27 69
Straightedge for highways (PD) Nov. 10 82
Tape recorder—many speeds but no reel (PD).....Dec. 8 92
Tape recorder rides planes (PD) Sept. 1 40
Telephone—Evolution of a loudspeaker telephone—from idea to form. E. J. Tangerman .....July 28 30
Telephone, Russian (T).....Sept. 22 37
Teleprinter high-speed (D).....Dec. 8 38
13 handy lever mechanisms. Federico Strasser (DR).....Sept. 15 98
Today's plowshares: bigger, more versatile (N).....Aug. 11 19
Toggle in hydraulic cylinder (SP) July 21 89
Typing perforator, high-speed (D) Sept. 8 5
Typewriter for engineers (N)....Aug. 18 21
Wiper consists of bladed bronze rings and synthetic mounting ring (SP) Nov. 3 32

Instrumentation

Air-filter gage (SP).....Dec. 8 115
Automated railway tested in Russia (N) .....Oct. 6 16
Automation in Red China moving fast —Peiping Show warns the West (N) Oct. 20 18
Automation with quality control built in at Ford Motor's Lima, Ohio plant (N) .....Sept. 8 20
Counter, electrical printing (SP) July 21 89
Counter, remote registering (SP) Dec. 22 71
Device indicates braking torque developed by a permanent magnet (D) Sept. 1 20
Digital shaft-angle encoder (SP) July 28 34
Dual bourdon-tube gages (SP)..Nov. 17 41
For measuring RPM—which tachometer? H. D. Drage.....Nov. 10 89
How much should a company automate? (PV).....Nov. 3 30
Machine-tool automation made less expensive (N).....Dec. 1 18
Mail-sorters—Detroit P.O. to get first automatic machines (N)....July 28 20
Manned space vehicle awaits better instrumentation (N).....Nov. 17 21
Measurement methods retard US design progress (N).....July 28 22
Monitors heat, or counts (SP)...Oct. 6 35
Numerical control. Rosenblatt & Dutcher .....Oct. 27 50
Numerical control and the design engineer. H. J. Langlie.....Oct. 20 23
Production machines that "talk back" to man (N).....Sept. 15 39
Pulse counter to rates of 100,000 sec. (D) .....Oct. 6 5
Red China joins USSR to pioneer new automation techniques (N)...Nov. 24 23
SAGE system—first sector now operating (N).....July 21 22
Scale gages to hundred-thousandths (PD) .....Aug. 18 67
Silicon temperature probe (SP).Sept. 8 36
Slate '60 automatic control confab in Moscow (N).....Dec. 29 25
Square root integrator (SP)....Aug. 18 87
Storing and availability of engineering data (A).....Aug. 4 90
Tape searcher (SP).....Dec. 15 35
Temperature control (SP).....Dec. 1 31
Temperature measurement in solids. Giedt & Rall.....July 21 65
Torsional vibration measured by strain gage (D).....Oct. 20 8
USSR claims thought-control mechanical hand (N).....Nov. 10 39
USSR proposes vast automation scheme (N) .....Aug. 25 16

Insulation, Electrical

Improved electrical insulation and pressure sensitive tapes (D)..Dec. 22 22
Insulation problems: answers to come (N) .....Dec. 15 12

Insulation, Thermal

Acid-resistant insulation (SP).July 28 35
A "chemical insulator" for copper (D) Sept. 8 5
Refrigerator-freezer combination features thermal insulation twice as efficient (D).....Aug. 11 5

—J—

Joining

Linkage joints. Ho Chow.....Dec. 8 87
Mechanical joining of plastics. Cheney & Ebeling (DD).....Mid-Sept. G2
Mechanical methods of joining tubing (DD) .....Mid-Sept. G12
The pin (A).....Aug. 4 90
Welded joint design (A).....Aug. 18 116

—L—

Linkages

How to replace gears by linkages (A) Aug. 4 90
Linkage joints. Ho Chow.....Dec. 8 87
Roberts' Law helps you find alternate four-bar linkages. R. T. Hinkle Oct. 27 54
13 handy lever mechanisms. Federico Strasser (DR).....Sept. 15 98

Lubrication

ASME-ASLE Lubrication Conference papers (A).....Oct. 27 100
Alarm system (SP).....Sept. 29 59
Ball and roller bearing lubrication (A) Nov. 10 153
Effects of an antiwear lubricant-additive (A).....Dec. 8 147
Gear lubricant deposits web rather than film (N).....Sept. 8 14
High-temperature lubricants (A) Sept. 1 55, (SP).....Oct. 13 103
Lubricants from rice oil (D)..Dec. 22 22
Lubricating oils under pressure (A) July 21 118
Lubrication fundamentals (A)..Aug. 18 116
Manganese organometallics—new antiwear additives for lubricants (D) Nov. 10 36
Motor oil can't be restored (D)..July 7 17
NLGI annual meeting, Oct. 27-29, Chicago papers (A).....Nov. 24 107
New techniques revealed at West Coast lubrication conference—16 papers presented at ASLE/ASME Lubrication Conference. Ernest Rabinowicz Nov. 10 84
Noncombustible lubricant (SP)..Nov. 3 32
Non-petroleum lubricants (D)..Oct. 13 36
Octane requirements can be held down by proper choice of engine oil (D) Aug. 4 19
Organize plant lubrication (A).Oct. 13 143
Papers from the ASLE 1958 annual Meeting, Cleveland (A).....July 7 110
Plastics as solid lubricants and bearings (A).....Aug. 18 116
Refrigerant lubricant qualities under study (D).....Oct. 20 5
Remote-fill lubricators (SP)...Dec. 29 30
Sensory examination of greases (A) Oct. 13 145
Step bearing . . . a new concept in air lubrication. C. R. Adams....Dec. 8 96
Viscosity-temperature characteristics (A) .....Dec. 22 86

—M—

Machining

AIEE machine-tool conclave (N) Nov. 3 21
Automatic machine produces sandwich honeycomb (SP) .....July 7 81
Automation in Red China moving fast —Peiping Show warns the West (N) Oct. 20 4 18
Automation of machine-tools made less expensive (N).....Dec. 1 18
Bakery operation—twister-molder panner supplies baking oven (PD) Sept. 15 91
Cams drive steel-squeezing dies (PD) Dec. 8 95
The case for swaging. L. A. Whiting Nov. 24 70
Control panel symbols—no final decision (N).....July 7 21
Crankshaft-peening machine — screw positions nozzles (PD).....July 7 63
Debugging—that last step in design. D. C. Cumming.....Sept. 15 92
Eccentricity for accuracy in close-tolerance machinging (PD).....Aug. 18 66
Electrochemical machining (SP) Sept. 8 36
German machine tools: still climbing (P) .....Dec. 22 43
Hydrostatic chucking devices (D) Oct. 13 35
Internal splines can be swaged (D) Nov. 24 22
Loom-opposed flywheels for smoother feed (PD).....Aug. 18 66
Machine-tool designers announce new control developments (N).....Oct. 27 25
Machine tool with a sense of touch (PD) .....Nov. 24 60
Machine-tools—large size machine tools to make thin-section parts for aircraft and missiles (T).....Aug. 25 26
Metal cutting (A).....Aug. 18 116
Miller floats in oil (PD).....July 7 61
New cutting tools accelerate machine tool R&D (N).....Aug 4 23
Numerical control. Rosenblatt & Dutcher .....Oct. 27 50
Numerical control and the design engineer. H. J. Langlie.....Oct. 20 23
Paris Trade Show displays automatic tools (N) .....Oct. 13 40
Polk, L. F. predicts 7th decimal by '68 (N) .....Dec. 8 40
Production machines that "talk back" to man (N).....Sept. 15 39
Setup banishes kinks, then machines stock (PD).....Sept. 15 90
Tapped nuts guide the tapper (PD) July 21 72
USSR's machine-tool industry mapped (N) .....Dec. 22 26
US machine tool builders OK international symbols for control panels (N) Dec. 8 40
Versatile lathe cuts tool cost (PD) July 21 73

Magnesium

Magnesium alloy treatments (DD) Mid-Sept. C4
Magnesium-beryllium alloys (D).July 7 18
Magnesium wheels for cars and trucks? (D) .....Dec. 8 37
Makers eye car market (N)....Nov. 10 39

Magnets

Magnetic control component (SP) Nov. 3 33
Magnetic materials (A).....Sept. 1 76
Magnetic materials coming to market (N) .....Oct. 20 11
Magnetics assist in fork lift trucking of 10-ton tinplate coils (N)..Sept. 15 40
Progress in magnetic refrigeration (D) Dec. 15 5
Transparent ferrites aid in magnetism studies (N).....Sept. 22 10
University of Calif. develops powerful electromagnet (N).....Aug. 4 24

Materials Handling

Conveyor rolls—how to design for drive or drag. L. H. Austin.....Sept. 15 78
New data on working height for packaging-line conveyors (D).....Dec. 15 5
Uranium handling—a problem in fire prevention (N) .....July 28 12

Mathematics

Correlation analysis (A).....Dec. 8 143
Curve fitting. T. R. Hoffmann (DD) Mid-Sept. A15
Design of experiments. E. R. Schwarz Sept. 22 34
Figures don't lie . . . or do they? (Ed) .....Nov. 10 69
Method of finite differences. Shaffer & Krause .....Oct. 13 77
Statistics build precision and economy into material specifications. Sheppard & Ginsburg.....Aug. 18 75

Metals, Ferrous

Alloys of vastly dissimilar metals (D) Sept. 8 5
Cemented borides show promise as cutting-tool materials (D).....Nov. 10 36
Composite metal (SP).....Dec. 29 31
Costs—how cost patterns are changing (N).....Sept. 8, 14; Dec. 15 12
Heavy metal solves weighty problems. A. R. Gardner.....July 21 62
High-temperature metal performance reports from research (N)...Nov. 17 12
Iron-aluminum alloys may take the place of stainless steel (D)..Sept. 1 20
Iron—corrosion rate of wrought iron (DD) .....Mid-Sept B5
Lead—high-purity lead is getting close attention (D) .....Dec. 15 5
Lead-zirconium alloys (D).....Oct. 27 20
Metal alloys are liquid (SP)..July 28 34
More R&D on ultra-pure metals urged (N) .....Dec 22 27
Plasma arc process—parts can be built from ultrahard metals (D)..Nov. 24 22
7 closer looks at metal properties. Edward Loria .....Oct. 27 48
Stress corrosion in metals. Dr. E. H. Phelps .....Aug. 4 56
Transparent ferrites aid in magnetism studies (N).....Sept. 22 10
Vacuum gives top-quality metals. L. W. Johnson.....Aug. 18 72

Metals Ferrous see also **Steel**

Metals, Nonferrous

Alloys of vastly dissimilar metals (D) Sept. 8 5
Beryllium—rolled beryllium sheets tested for Air Force (N)....Sept. 8 26
Boron and lithium containing materials ready for design evaluation (D) Dec. 22 21
Calcium metal headed for new product applications (N) .....Sept. 22 12
Cemented borides show promise as cutting-tool materials (D).....Nov. 10 36

(A) Abstract. (D) Developments. (DD) Design Digest. (DS) Design Roundup. (Ed) Editorials.
(N) Technical News. (P) Perspective. (PD) Product Design. (PV) Points of View.
(RS) Reference Book Sheets. (SP) Significant Parts. (T) Trends in Appearance Design.

Cerium aids in making super alloys and better solder (N).....Oct. 6 11
Costs—how cost patterns are changing (N).....Sept. 8, 14; Dec. 15 12
Ductile vanadium (A).....Dec. 22 86
Exotic metals in stock (N)....Aug. 25 11
Fotofoil, anodized colored metal sheet coating with light-sensitive acid-resistant ink for name plates for prototypes. W. R. MacKinnon...Oct. 13 88
Graphite parts coated and bonded by new processes (D).....Sept. 15 35
Heavy metal solves weighty problems. A. R. Gardner.....July 21 62
High-temperature alloys (N)..Dec. 15 12
High temperature metal performance reports from research (N)...Nov. 17 12
Lead-zirconium alloys (D).....Oct. 27 20
Magnesium-beryllium alloys (D) July 7 18
Metal alloy assists in alkali solubility (N).....Sept. 22 10
Metal alloys are liquid (SP)..July 28 34
Molybdenum disilicide heating elements (D).....Nov. 3 8
Molybdenum supports for semiconductors (N).....Aug. 11 12
Molybdenum that is workable as-cast (D).....Sept. 22 5
More R&D on ultra-pure metals urged (N).....Dec. 22 27
New super alloy, Rene 41, bids for hot jobs. Iverson & Pohlman...July 21 76
Plasma arc process—parts can be built from ultrahard metals (D)...Nov. 24 22
Pure chromium need not be brittle (D) Sept. 8 8
Rare-earth garnets—magnetic materials come to market (N)...Oct. 20 11
Rare earths: more and purer (N) Nov. 17 12
Silicon metal in new forms at lower costs (D).....Nov. 17 5
Stress corrosion in metals. Dr. E. H. Phelps.....Aug. 4 56
Ultra-pure copper made in England (D).....Nov. 3 8
Vacuum gives top-quality metals L. W. Johnson.....Aug. 18 72
Zinc find in Canada will be developed (D).....July 28 8
Zinc foil, strong, ductile (D)...Oct. 6 5
Zirconium at half the cost (N) Sept. 22 12
Zirconium—is it ready now? (N) Nov. 3 12

Metals, Nonferrous see also **Aluminum, Magnesium, Titanium**

Meters
Bench micrometer (T).....Aug. 25 26
For measuring RPM—which tachometer? H. D. Drage.....Nov. 10 89
Linear potentiometer (SP).....Dec. 1 30
Miniature edgewise meter (SP) Aug. 25 31
NBS develops direct-reading viscometer (N).....Aug. 18 22
Pressure meter to test high-viscosity plastic resin (D).....July 28 8

Missiles
A dog-gone mouse (Ed.).....Aug. 18 57
Air Force Falcon has ceramic nose cone (D).....Oct. 6 7
Better high-speed missile target sought by Navy AF (D).....Nov. 3 7
Bids asked on space capsule design (N) Nov. 24 26
Cargo carrying missile that lobs (N) Oct. 27 21
Experiment seeking to improve design of high speed missiles (N)..Aug. 11 22
"Hot" launching pads complicate nuclear rockets (N).....Sept. 8 10
Kingfisher target missile (N)..Sept. 1 26
Future power sources from free radicals (D).....Aug. 11 5
Hypersonic gas gun tests two ways (N) Aug. 25 14
Improved atmospheric equipment needed for manned space flight (N) Oct 13 41
Making missiles versatile (P)..July 21 59
Medaris says missile designers need new training (N).....Sept. 29 24
Million-pound-thrust rocket project for Rocketdyne (N).....Sept. 8 22
Missile reliability "predicted, assessed, measured and controlled" (D) Aug. 11 7
NASA piles up space projects totaling $343 million (N).....Aug. 25 15
Navy plans satellite launch from aircraft (D).....Aug. 25 6
New satellite program scheduled (N) Dec. 15 23
No-gimbal inertial guidance system (N).....Sept. 1 21
Nuclear reactor for rocket propulsion (N).....Sept. 1 23
Photon rockets for space ships? (N) Aug. 11 10
Plastic bond needed for future missile casings (D).....Oct 20 7
Polaris may have materials problem in first stage (D).....Oct. 6 7
Polaris testing—"Product Engineering" goes aboard ship to see it done (N) Dec. 22 23
Rival weapons projects—technical evaluation or politics? (N).....Oct. 20 15
Second moon shot set for September (D).....Sept. 8 7
Space rudder uses liquid-filled hoops (N).....Dec. 15 10
Sputnik III launched with single rocket (N).....July 21 19
Test firings of dummy Polaris missiles (D).....Dec. 1 7
Thrust canceler for solid-propellant rockets (D).....Nov. 3 5
Titan launcher (N).....Dec. 29 25
Vanguard launching troubles denied (N).....Sept. 15 42
Who will control US space program? (N).....Oct. 27 25

Mobile Equipment
Army tractors—more power per pound (N).....Sept 22 29
Earthmover-scraper (N).....Oct. 6 15
Earthmovers still get larger—scraper (N).....Nov. 24 25
Farm tractor (T).....Nov. 3 29
Largest self-propelled earth-moving scraper (N).....Sept. 1 23
Magnetics assist in fork lift trucking of 10-ton tinplate coils (N)..Sept. 15 40
Mechanical mule is lightweight—but muscular (PD).....Sept. 29 42
Mobile in-plant equipment; power vacuum sweeper; flat-bed truck (T) Aug. 11 34
Resistor smooths lift-truck drive (PD) Aug. 4 47
Sandhopter car (D).....Dec. 1 8
Supercharger gives peak power at right time (PD).....Oct. 13 82
Today's plowshares: bigger, more versatile (N).....Aug 11 19
Tractor, re-designed gas diesel (T) from France (T).....Sept. 8 34
Tractor with automatic steering (N) Sept. 15 42
Turbo tugboat for airliners (N) Sept. 22 21

Models
Build a model shop—Plan '59 W. E. Boggs.....Oct. 13 74
Model shop saves development time—Plan '59.....Oct. 6 32

Modernization
Plan '59
Why modernize?—report
Research and development—how much should you spend?..Oct. 6 23
Is your engineering laboratory still in the race?.....Oct. 6 26
Plan for efficiency with modern drafting equipment.....Oct. 6 28
Company libraries stretch R&D funds.....Oct 6 30
Model shop saves development time.....Oct. 6 32
Why modernize engineering? (Ed) Oct. 6 21
Plan '59 . . . How to modernize now
How modern is American industry—a report by the McGraw-Hill Dept of Economics.....Oct. 13 61
How to modernize engineering (Ed) Oct. 13 65
What you need for a better engineering laboratory. R. W. Carson Oct. 13 66
For today's draftsman, these modern tools. Nicholas Chironis Oct. 13 68
More service from your company library. Boyle & May.....Oct. 13 72
Build a model shop W. E. Boggs Oct. 13 74

Molding
Best results with phenolic molded parts. D. M. Buchanan.....Sept. 1 44

Motors and Motor Control
Before selecting a fhp motor. N. L. Morgan.....Dec. 22 60
Britain's new variable-speed motor, John Tunstall.....July 7 68
Calculate gyroscope precession torques. A. E. Maine (DD).....Mid-Sept. H8
Future of constant-speed drives in aircraft (D).....Nov. 10 36
Encapsulated motor stator (SP) July 21 89
Guide to motor application (DD) Mid-Sept. H6
Guide to selecting polyphase motors. C. C. Libby.....Aug. 18 58
Here's help in selecting the right motor. F. D. Yeaple Jr.....Oct. 13 86
Hydraulic motor doubles as truck wheel (PD).....Nov. 10 83
Immersed motors. F. D. Yeaple Jr. Sept. 15 80
Liquified-gas hydraulic motor (N) Dec 1 18
Lightweight intermittent-duty motor (SP).....Aug. 25 31
Miniature dc motors (SP).....Dec. 1 31
Miniature reversible motor (SP) Nov. 3 32
Miniature stepping motor (SP).Dec. 29 30
Motor-alternator (SP).....Dec. 1 31
Motor operates at full hp only underwater (SP).....Sept. 1 55
Motor that will run full of water (D) Aug. 18 17
One motor can take the place of two or more with new scissors design (D) Oct. 6 8
Radial-piston hydraulic motor (D) Dec. 1 8
Rotary air motor for fhp (SP)..July 7 81
Shaft-mount gear motor (SP)..Aug. 25 31
Single-phase motors enclose controls (SP).....Oct 6 35
Stepless control seen as important future motor development (N)..Oct. 13 37
Stepper motor (SP).....Aug. 25 31
Subminiature servomotor (SP).Nov. 10 101
Torque converter built for choice of circuits (SP).....Aug. 4 67
Underwater motor cooled and lubricated by salt water (N).....Aug. 25 15
Which type of torque-limiting device? Bareiss & Brand.....Aug. 4 59

Motors, Hydraulic
Constant-speed hydraulic drives (D) Oct. 27 20

—N—

Noise
Engine exhaust system noise control. D. G. Thomas (DD).....Mid-Sept. H14
How to make sound tests at 150 db. M. T. Anderson.....Dec. 22 58
Miniature noise muffler (SP)....Dec. 1 31
Noise chamber for testing 150-db (N) Dec. 29 26
Planemakers cut engine outlet, inlet noise (N).....Oct. 6 18

Nucleonics
Atom data here and coming from Geneva Conference (N).....Oct. 6 10
Atomic energy and the law (P) Pt 1 Oct. 27-41, Pt 2.....Nov. 10 67
AEC outlines isotope uses (N).Sept. 22 30
AEC probes radiation (N).....July 7 21
British drop liquid-cooled reactor systems (N).....Aug. 18 21
British propose reactor liability law (N).....Nov. 17 24
Crossbow tests reactor resistance to control-rod blowout (N).....Dec. 1 10
Fusion power: how cheap, how soon? (N).....Aug. 18 21
Guide to reactor ratings (N)...Oct. 20 10
Heat-transfer media—new information available (N).....Dec. 1 12
Heavy water available at $28 a pound (N).....Aug. 25 10
"Hot" launching pads complicate nuclear rockets (N).....Sept. 8 10
International Atomic Conference will feature materials data (D)...Aug. 25 8
Irradiated gases are new material source (N).....Oct. 6 10
MIT reactor goes critical (N)..Sept. 1 24
More power from conventional fuels (D).....Oct. 27 19
New reactor type to be explored (D) Aug. 4 19
Nuclear energy needed for moon trip (N).....Oct. 20 10
Nuclear particles outspeed light (N) Nov. 3 10
Nuclear power costlier than they thought (N).....Sept. 22 30
Nuclear-powered submarines—Down to the sea (P).....Oct. 14 59
Nuclear propulsion for ships (D) Sept. 8 7
Nuclear reactor for rocket propulsion (N).....Sept. 1 23
Organic moderator used in German reactor (N).....July 28 22
Plutonium recycle reactor (N).Sept. 1 24
Project names for the atom (N) Dec. 1 10
Radiation has the jump on ultrasonics (D).....Dec. 29 28
Radioactive waste disposal worries reactor builders (D).....Oct. 20 8
Radiation-activated light sources (D) Sept. 29 20
Reactor miniaturization and mechanization may lead to aircraft propulsion (D).....Oct. 20 5
Soviets claim lead in nuclear power race.....Sept. 22 33
Thermoelectric generator with nuclear-battery heat source (D).....Aug. 11 5
Ultrasonic decontaminators remove radioactive particles (D).....Sept. 8 8
Ultrasonic machining (DD) Mid-Sept. D12
Underground nuclear explosions for peaceful purposes caught in diplomatic squeeze play (D).....Oct. 6 7
Underwater cargo vessel (N)..Sept. 29 22
US Atomic Industry plan for making nuclear power economical in US by 1970 (D).....Sept. 8 7
Uranium: come and get it (N)..July 28 12
Uranium handling—a problem in fire prevention (N).....July 28 12
Yugoslavia installs reactor (N) Nov. 10 40

—P—

Paper
Metallized paper, competitive in price (D).....Sept. 1 19
NBS studies paper and cellulose (N) Oct. 6 11
Nylon-impregnated paper (SP).Sept. 22 42
Papers with high dimensional stability (D).....Aug. 18 18

(A) Abstract. (D) Developments. (DD) Design Digest. (DS) Design Roundup. (Ed) Editorials.
(N) Technical News. (P) Perspective. (PD) Product Design. (PV) Points of View.
(RS) Reference Book Sheets. (SP) Significant Parts. (T) Trends in Appearance Design.

Patents

Design patent applications to get faster action (D).....Nov. 3 7
Foreign patents—nuisances or nuggets? Worth Wade .....Dec. 15 27
Halpern, Dr. Otto granted "closed" trial by Second US Court of Appeals (N) Aug. 18 19
Invention in the USSR. Victor Louis Nov. 17 33
Let someone else develop and license your invention (N).....Oct. 6 15
The little man can't protect his patents. Davidier Von Ludwig.....July 28 26
"The little man can't protect his patents" . . . (PV).....Sept. 22 38
Look for Congress to revamp patent provisions (D).....Dec. 1 7
Making money with patents is tough—but not impossible. R. G. Crooks Nov. 3 24
The patent laws: for whose benefit? (P) .....July 7 49
Patent royalties ruled a capital gain (D) .....July 28 7
RCA changes patent policy; settles with US (N).....Nov. 10 41
'Shame Show' indicts Japanese design pirates (N).....July 21 20
US product planners score against international design pirates (N) Nov. 24 26
U.S. Supreme Court to weigh inventor's secrecy plea (N).....Nov. 10 42
When is an idea worth patenting? (PV) Oct. 20 28

Personnel

Are you creative?—ask your wife. Dr. J. H. McPherson.....Nov. 17 28
British take technical census (N) Oct. 20 22
Engineers importance rises with need for reliable components (N)..Aug. 11 22
More service from your company library—Plan '59. Boyle & May Oct. 13 72
Research management . . . a problem in personalities. Peters & Michelson Sept. 8 30
Reservoir of women engineers in US virtually untapped.....Sept. 8 19
A salaried industrial designer and his work—Robert Heyman of Newark Laboratory (T).....Dec. 15 30
US clears definition of technician (N) Oct. 13 39
US to raise OEEC ante for more engineers (N).....Nov. 10 40
What you need for a better engineering laboratory—Plan '59. R. W. Carson Oct. 13 66
Who's out of step? (Ed).....Sept. 29 33
Woman engineer: a rarity in other countries (N).....Nov. 17 18

Photography

Drum camera best way to put motion on record. Dr. Karl Maier.....July 21 78
First fully automatic still camera (N) Nov. 10 39
Microfilm pushes drawings aside. W. J. Locke .....Oct. 27 44
Motion picture projector from France (T) .....Sept. 8 34
Name plates for prototypes with Fotofoil. W. R. MacKinnon.....Oct. 13 88
Prestressed spring drives camera aid (PD) .....July 7 60

Piping

Swivel joints. G. M. Bagnard
Swivel joints may work where nothing else can.....Aug. 4 40
Designing with swivel joints.Dec. 8 100
Swivel joints—charts find torque pressure loss (RS).....Dec. 22 67

Plastics

Acrylic plastic worm feed (N)..July 28 12
Anti-yellowing agents (D).....Oct. 27 20
Best recipe for casting urethane foam. Harry Gerstin.....Nov. 10 86
Best results with phenolic molded parts. D. M. Buchanan.....Sept. 1 44
Blended Teflon components (SP)..Dec. 1 115
Chart European plastics (N)...Sept. 1 22
Comparison of phenolic and polyester premix materials. Colao & Gurvitch (DD) .....Mid-Sept. C12
Dacron will be standard reinforcement in V-belts (D).....Dec. 29 27
Designing stiffness into plastic structures (A).....Oct. 13 143
Epoxy paste cures underwater (SP) Sept. 8 36
Extruded polyethylene plate (SP) Nov. 10 101
Foam film used as medium-gage sheeting (D).....Aug. 25 5
Heat-stable epoxy resin (SP)..Dec. 29 30
How to get the polyethylene you need (A) .....Dec. 8 147
Improved synthetic plastics (D) Nov. 10 36
Instrument panels may get a new plastic—Delrin (N).....Nov. 3 12
Laminate, XXXP, is flame-retardant, low in cost (D).....Oct. 20 5
Liquid fuels stored and shipped in plastic foam (D).....Nov. 17 8
Low-density foams as energy absorbers (A) .....July 21 118
More external use of plastics on cars (N) .....Dec. 8 42
New resins that resist heat (D).Sept. 1 19
Nylon—additives strengthen sintered nylon parts. L. W. Alexander Sept. 15 86
Nylon film, strong, transparent (D) Nov. 10 35
Nylon industrial fiber—lower prices (D) Dec. 22 21
Photosensitive plastic sheet (D).Aug. 4 20
Plastic bond needed for future missile casings (D).....Oct. 20 7
Plastic-film dust boot (SP).....Oct. 27 69
Plastic glossary—111 Polymers in space (N) .....Aug. 11 12
Plastic heat resistance at ultrahigh temperature (N).....Nov. 17 12
Plastics as solid lubricants and bearings (A).....Aug. 18 116
Plastics for the 3500 F range (D) July 21 18
Plastics properties chart (DD) Mid-Sept. C11
Plastics, stable from —80 to 800 F being sought by USAF (D)..July 7 17
Polycarbonates stirring world-wide interest (N).....Aug. 25 8
Polyester glass moldings form body of Gran Tourisme coupe (N)...July 7 21
Polyethylene—flame-retardant compound (N).....Sept. 8 26
Polypropylene—new strength and heat resistance (N).....Aug. 11 12
Polystyrene models speed design tests for investment casting (N)..Sept. 1 22
Polystyrene paper laminate is heat formed (D).....Dec. 29 28
Polystyrenes—two heat-resistant polystyrenes (D).....Oct. 6 8
Reinforced epoxy with metal fiber (A) Oct. 27 100
Relationship between properties of epoxy resin. John Delmonte (DD) Mid-Sept. C5
Rigid PVC plastics (SP).....Sept. 29 59
Russians not far behind in plastics (N) July 21 22
Selecting plastics (A).....Dec. 8 147
Scratch-resistant, transparent acrylic plastics (D).....Sept. 1 20
Styrenes, low-static (SP).....Sept. 22 43
Survey of new plastics (A)....Nov. 10 153
Thermally stable laminating resins (D) Oct. 13 35
Three new tough, rigid thermoplastics: a comparison. F. R. Park....Sept. 29 36
Torpedo launcher (PD).....Nov. 10 80
Transparent film with corrosion-inhibiting coating (D).....Oct. 27 20
Trim 88-lb plastic body for Italian sports car (N).....Oct. 13 38
Two clear plastic films (D).....July 7 18
Where vacuum forming stands today. R. L. Daggett.....Dec. 22 56
Wire harnesses made from plastic coils (D) .....Sept. 8 8

Plating

Bright-silver plating process (SP) Oct. 6 35
Double copper bath improves chrome plate (N).....July 28 20
Nickel composition plating (SP) Oct. 20 30
Plasma-arc plating. R. D. Stackhouse & others.....Dec. 8 104
Plasma-arc torch plating (N).....Dec. 1 17
Plating process that will coat, but not plug (D).....Sept. 1 20

Pneumatics

Air-hydraulic unit (SP).....Nov. 17 40
Ejectors for suction pressure. F. D. Berkeley (DD) .....Mid-Sept. J12
Fluid power for machine-tool controls. F. D. Yeaple Jr. .....Aug. 18 70
Pneumatic clamp for machine tools (D) Aug. 18 17
Pneumatic de-icing systems (D) Aug. 18 17
Safeguarding the air supply. E. L. Holbrook .....Sept. 29 48

Powder Metallurgy

Better strip from metal powders (N) Sept. 22 12
Iron powder metal bearings (SP) Nov. 17 41
Iron powder parts have steel composition (N).....Sept. 22 22
Nylon—additives strengthen sintered nylon parts. L. W. Alexander Sept. 15 86
Pressureless sintering process produces high-density powdered metal (D) Sept. 22 8
Slip casting . . . its field broadens. L. M. Schifferli Jr.....Oct. 13 84
Solid fuels get ultrafine aluminum powder as a thrust booster (N)..July 7 21

Presses

CSA standards for punch press operation (DD).....Mid-Sept. H12
Packaged punch for presses (PD) Dec. 22 52
Press, hydraulic—from France (T) Sept. 8 35
Press—second-flywheel gives double-duty press (PD).....Sept. 1 41
Shortened press reduces stretch (PD) Nov. 10 82
Those heavy presses can pay off. R. W. Smith .....Sept. 29 34

Printed Circuits

Imbedded printed circuits (SP).Nov. 10 101
Localized solder coating in printed circuits (SP) .....Oct. 20 30
Printed circuits have a future; their designers, many headaches (N) Oct. 27 23
Standardized method for testing insulation resistance of printed-circuit boards (D).....Nov. 24 22

Product Development

Build a model shop. W. E. Boggs Oct. 13 74
Evolution of a loudspeaker telephone—from idea to form. E. J. Tangerman July 28 30
How to organize for technical development (N).....Oct. 20 16
Industrial designer calls for do-it-yourself market research (N).....Nov. 24 24
Is your engineering laboratory still in the race?—Plan '59.....Oct. 6 26
Model shop saves development—Plan '59 .....Oct. 6 32
Passport to tomorrow . . . a study of R&D techniques (Ed).....Dec. 29 2
Passport to tomorrow's new products—a study of R&D departments in eight companies—their problems and solutions. F. R. Park.....Dec. 29 5
Pre-development planning: four steps to low-risk products. Zuce Kogan Aug. 11 32
Research and development—Can it really pay off for the small company? Plan '59.....Oct. 6 23
What is the proper balance between government and commercial work within a company? (PV)....Aug. 25 28

Professional Trends

Research management . . . a problem in personalities. Peters & Michelson Sept. 8 30

Publisher's Postscript

Back-patters .....Nov. 3 40
Engineers have broad interests.Aug. 11 48
How to gamble on a sure thing.Dec. 29 36
It belongs to YOU.....July 14 56
Machine-tool fossils.....Nov. 17 48
Miniaturization .....Aug. 25 36
No tariff on knowledge.....Dec. 1 36
One product—Technology.....Sept. 8 48
Plan now for 1959.....Oct. 6 40
Responsibility, and now authority Oct. 20 36
We need your opinion.....Dec. 15 40
We watch the Bellwethers.....July 28 40
A worth-while BONUS for you.Sept. 22 52

Pumps

Design changes foreshadowed by changes in aircraft fuels (D).Nov. 24 21
High vacuum produced by ion pumps (N) .....Nov. 17 10
Non-clogging centrifugal pumps. T. Ysge .....Nov. 10 78
Pump materials designed for ultralow temperatures (N).....Aug. 25 11
Vacuum pump freezes out air (N) Nov. 10 42

—R—

Radio and Television

Automatic channel-switcher (D) Sept. 22 8
Closed-circuit television system (N) Oct. 6 15
Featherweight TV shown by GE (N) Nov. 10 42
Portable color TV system (N)..Sept. 15 38
"Safety tube" eliminates front windows for TV sets (D).....Aug. 18 18
Super-bright X-ray TV (N)...Sept. 29 23
Table model radio-phonograph (T) Nov. 17 38
Television set's tube swivels—French design (T).....Sept. 8 25
TV tube only 3 in. thick (D)..July 28 8

Rectifiers

Metal rectifiers and semi-conductors (DD) .....Mid-Sept. 12
Prototype 50-amp controlled silicon rectifier (N).....Oct. 27 25
Semiconductor rectifiers for 750 F service (D).....Nov. 3 5

Relays

Contact "bounce" is eliminated by new relay design (D).....Dec. 22 22
Ionization chamber serves as a resistor in Swiss relay (D).....July 7 17
Miniature sealed relay (SP)....Nov. 17 40
Money-saving electromagnetic relays. Ralph Probert.....Nov. 24 66
Multi-pole relays (D).....Nov. 24 21
Predicting relay performance and stability (A).....Aug. 18 116
Sensitive Dc relays (DD)....Mid-Sept. 18
Snap-action power relay with rolling springs (SP).....Aug. 11 37

Research

ARPA projects stress science for defense (N).....Dec. 1 19
Activities of the federal government (D) .....Dec. 1 7

(A) Abstract. (D) Developments. (DD) Design Digest. (DS) Design Roundup. (Ed) Editorials.
(N) Technical News. (P) Perspective. (PD) Product Design. (PV) Points of View.
(RS) Reference Book Sheets. (SP) Significant Parts. (T) Trends in Appearance Design.

Air Pollution Foundation smog study (N) ..... Nov. 10 40
Case Institute plans research guide (N) ..... Nov. 24 24
Company libraries stretch R&D funds—Plan '59 ..... Oct. 6 30
Franco-German research institute nears reality (N) ..... July 28 24
Fuel-cell research for hydrogen-oxygen dc power (N) ..... Nov. 3 10
How Moscow designs—special issue—the Academy of Sciences tops all techniques ..... July 14 38
How to read heat transfer in Russian (A) ..... Oct. 13 145
Improve method of measuring surface defects (N) ..... Sept. 15 39
Industry of discovery (Ed) ..... July 21 61
International atomics information flow speeded (N) ..... Aug. 11 27
International Conference on Scientific Information to be held in Washington Nov. 16-21 (N) ..... Oct. 13 38
Isotope separation process developed in Germany (D) ..... Nov. 17 8
Molecular engineering offers new design concepts (N) ..... Aug. 25 19
More power from conventional fuels (D) ..... Oct. 27 19
More R&D on ultra-pure metals urged (N) ..... Dec. 22 27
More service from your company library—Plan '59. Boyle & May ..... Oct. 13 72
New data on gases and liquids that carry heat (N) ..... Dec. 1 12
Ordnance people hear pleas for informal R&D (N) ..... Dec. 15 22
Passport to tomorrow . . . a study of R&D techniques (Ed) ..... Dec. 29 2
Passport to tomorrow's new products—a study of R&D departments in eight companies, their problems and solutions ..... Dec. 29 5
R&D flexibility sought by GE executive (N) ..... Aug. 11 28
Research and development—Can it really pay off for the small company?—Plan '59 ..... Oct. 6 23
Research management...a problem in personalities. Peters & Michelson ..... Sept. 8 30
Salt water goes fresh as pilot plants test conversion theories (N) ..... Oct. 13 39
Sharpest new product eye: management or research? (N) ..... Oct. 27 21
Ultralow temperature research goes into high gear (N) ..... Sept. 8 10
USSR technical journal abstracts available (N) ..... Aug. 18 22
Universities: aids to industry's research (P) ..... Aug. 4 35
We get translations as fast as Russians (N) ..... Dec. 8 44
World seeks ways to store science data (N) ..... Dec. 8 41

Rubber

Cast urethane rubber for tail wheels (N) ..... Nov. 24 23
Complex silicone sponge shapes (SP) ..... Aug. 25 30
Improved synthetic rubbers (D) ..... Aug. 25 - 5, Nov. 10 36
New rubbers will resist cracking (D) ..... Sept. 22 5
Nitrile silicone rubber resists oil at high, low temperatures (N) ..... Aug. 18 23
Silicone rubber sponge. J. C. Walton ..... Aug. 4 54
Stronger, more abrasion-resistant rubber products (D) ..... Aug. 4 20
Urethane synthetic rubber tires for industrial trucks (D) ..... Dec. 29 28

Russia

How Moscow Designs—special issue ..... July 14
Because we need to know ..... July 14 2
First, the frame of reference. Moscow today ..... July 14 5
How new industrial equipment is developed ..... July 14 13
Prices? Selling? Redesign? Service? ..... July 14 21
What Soviet industry and people can buy ..... July 14 26
Appliances for sale at GUM ..... July 14 29
For the newest equipment, the Industrial Exhibition ..... July 14 30
The Academy of Sciences tops all techniques ..... July 14 38
Moscow University is the USSR's largest ..... July 14 40
The largest auto plant does its own design ..... July 14 44
The Soviet engineer and his rewards ..... July 14 50
Publisher's Postscript: it belongs to you ..... July 14 56
If you visit the USSR on business ..... July 14 57

— S —

Safety

Balanced program for improving drivers, roads and autos recommended (N) ..... Dec. 8 43
Carmakers spend $5-6 million annually to make cars safe (N) ..... Oct. 6 15
F-104 gets infrared fire control system (N) ..... Sept. 22 32
Portable firefighter (N) ..... Dec. 8 39
Safety doesn't sell (Ed) ..... Nov. 17 15
Should safety be legislated into consumer products? (PV) ..... Dec. 15 32
Uranium handling — a problem in fire prevention (N) ..... July 28 12

Sandwich Structures

Automatic machine produces sandwich honeycomb (SP) ..... July 7 81
15 plate-stiffenings compared (DI) ..... July 21 82

Sealing

Fluid and gas sealing elements (SP) ..... Sept. 22 43
Packed glands for high pressure—a foreign digest. J. L. Thomson (DR) ..... Nov. 10 - 94, Nov. 24 74

Seals

Basic principles of mechanical seals. T. J. Sniffen (DD) ..... Mid-Sept. F10
High-pressure shaft seal (SP) ..... Oct. 20 30
Seals for hydraulic systems (SP) ..... July 28 35
Synthetic felt seal (SP) ..... Sept. 15 105
Teflon retaining seals (SP) ..... Aug. 25 31

Silicon

Silicon metal in new forms at lower costs (D) ..... Nov. 17 5
Temperature probe (SP) ..... Sept. 8 36

Solar Power

Power station on the moon using the sun's energy (N) ..... Sept. 29 22
Solar-energy converters (D) ..... Nov. 10 35
Solar heat experiment may lapse—no money (N) ..... Aug. 11 30

Soldering

Solder for titanium (D) ..... Dec. 8 28
Soldering aluminum—a simple fluxless technique. Bouton & White (DD) ..... Mid-Sept. G10

Springs

Cantilever springs that roll with the load. J. D. Howell ..... July 7 58
Commonly used spring materials (DD) ..... Mid-Sept. B12
Design of helical springs for minimum values. Hinkle & Morse (DD) ..... Mid-Sept. F4
Helical springs (A) ..... Aug. 4 90
Herringbone and gimbal compression springs (SP) ..... Dec. 29 31
Prestressed spring drives camera aid (PD) ..... July 7 60
Springs that store energy best. Dr. K. W. Maier ..... Nov. 10 71
Vibration isolators with zero stiffness—a foreign digest (DR) ..... Sept. 29 52
Whip the backlash in spring clutches. Joseph Kaplan ..... Aug. 18 62

Standardization

Control panel symbols—no final decision (N) ..... July 7 21
IRE standards on reference designations for electrical and electronic equipment (DD) ..... Mid-Sept. I4
New design standards for brazed joints and tool steels (D) ..... Sept. 1 19
New standards for gears span wide range of quality. L. D. Martin ..... Dec. 22 46
Performance standard for brake linings (D) ..... Sept. 15 36
Standardized brain? (Ed) ..... Sept. 1 31
Tentative standards for class 5 interference fit threads (DD) ..... Mid-Sept. G16
U S machine tool builders OK international symbols for control panels (N) ..... Dec. 8 40
Urge standardization of support equipment (N) ..... Oct. 27 22
World getting together on standarized testing (N) ..... Nov. 24 27

Statistical Control

Computers permit new statistical analysis concepts to aid design (N) ..... Sept. 8 21

Steel

Alloy gains stressed part (SP) ..... Dec. 15 35
Dependability of nickel steels (DD) ..... Mid-Sept. D11
Designing with PH steels (DD) ..... Mid-Sept. B8
Glass-protected steel (DD) ..... Mid-Sept. C10
Higher-strength steels on a do-it-yourself basis (D) ..... Nov. 24 21
Magnetic-force welding for vinyl-clad steel. F. R. Park ..... Sept. 15 82
Magnetic properties of cast steel (D) ..... Nov. 17 8
Manganese joins aluminum to give strong stainless. Ham & Cairns Jr. ..... Dec. 22 50
Manganese - steel parts doubled in strength (D) ..... Dec. 15 5
Paper-thin stainless improves heat exchangers (PD) ..... Oct. 13 83
The right finishes for stainless steel. R. E. Paret (RS) ..... Oct. 13 99
Ultra-strength steels (DD) ..... Mid-Sept. B13

Stress Analysis

Conjugate-beam method. E. D. Clark (RS) ..... Aug. 18 83
Considerations for friction materials. T. W. Driesch (DD) ..... Mid-Sept. C16
Control of friction and wear stressed at ACS meeting (D) ..... Sept. 15 36
Curves find bending and torsion strength of thin-walled cylinders. Irene Kusmiss (RS) ..... July 21 85
Curves find compression strength of thin-walled cylinders. Irene Kusmiss (RS) ..... July 7 77
Edge area of bent-up shapes—k-factor speeds answers. S. W. Kaye (RS) ..... Sept. 15 101
Failure of metals under load (A) ..... Aug. 18 116
Fretting-fatigue failure of titanium-steel and steel-steel joints. W. L. Starkey & others (DD) ..... Mid-Sept. F15
Friction and wear of metals to 1000 C (A) ..... Oct. 27 100
How much stress on a bearing ball? J. E. Ruzicka (RS) ..... Nov. 10 97
How to calculate stresses in adhesive joints. H. A. Perry ..... July 7 64
How to calculate stresses in press-fit bushings. E. H. Schuette (RS) ..... Sept. 1 51
How to figure deflections of elastically suported cantilever beams. T. F. Callahaa (RS) ..... Aug. 4 63
Correction ..... Sept. 15 40
More surface polishing...less galling. W. H. Moore ..... Nov. 24 63
7 closer looks at metal properties. Edward Loria ..... Oct. 27 48
Shaft-peening and fatigue strength (A) ..... Aug. 4 90
Stress corosion in metals. Dr. E. H. Phelps ..... Aug. 4 56
Stress in flat-ended pressure cylinders. E. J. Cattabiani (RS) ..... Dec. 8 111
Tangential residual stress distribution in curved beams (A) ..... July 21 118
Tap the reserve strength in metal parts. D. J. Graziano ..... Sept. 29 44
A tonic for tired metal—Why have fatigue problems when it's easier to do without them? C. R. Smith ..... Dec. 1 22
Tubes under combined external pressure and axial load (A) ..... July 21 118

Switches

Air-jet-actuated switch (SP) ..... July 28 35
Explosion proof proximity switch (SP) ..... Nov. 17 41
Liquid-level switch (D) ..... Dec. 22 21
Low-force snap switch (SP) ..... July 28 34
Magnet-run mercury switch (SP) ..... Aug. 18 87
Midget rotary selector switch (N) ..... Dec. 15 19
Miniature pneumatic switch (SP) ..... Dec. 22 71
Motor-starting switch (D) ..... Sept. 29 20
Selector-switch knobs. G. A. Peters ..... Dec. 8 103
Sensitive pressure switch (SP) ..... Dec. 8 115
Solid-state proximity switch (SP) ..... Dec. 1 30
Subminiature thermal switch (SP) ..... Dec. 29 31
Switch in floor mat (SP) ..... Aug. 25 31
Switch-time nomograph. T. A. Prugh (DD) ..... Mid-Sept. 119
Vane-operated limit switch (SP) ..... Aug. 11 37

— T —

Tangents

The editor is Jiminy Cricket ..... Nov. 10 142
The hole story ..... Sept. 15 140
Reading should be a disease ..... Oct. 13 137

Telephone

Evolution of a loudspeaker telephone—from idea to form. E. J. Tangerman ..... July 28 30
Russian telephone (T) ..... Sept. 22 37
Transistorized intercom operates on batteries (D) ..... Oct. 20 8
Voice-actuated equipment (D) ..... Oct. 6 8

Terminology

Luminescene—a glossary of terms (N) ..... Nov. 3 10
New fibers—glossary (N) ..... Aug. 25 11
Plastic glossary III Polymers in space (N) ..... Aug. 11 12
Project names for the atom (N) ..... Dec. 1 10
Transistor types—a glossary of terms (N) ..... Nov. 17 10

Testing

Abrasion resistance—new test (N) ..... July 21 23
Application of solar furnaces. P. E. Glaser (DD) ..... Mid-Sept. A14
Auto parts get weather trials (N) ..... Nov. 17 22
Automated railway tested in Russia (N) ..... Oct. 6 16
Automated test stand replaces on-the-road driving (N) ..... Aug. 4 25
Boron and lithium containing materials ready for design evaluation (D) ..... Dec. 22 21
CAL building test apparatus for small rotorcraft, may replace costly wind tunnels (N) ..... Nov. 10 40

(A) Abstract. (D) Developments. (DD) Design Digest. (DS) Design Roundup. (Ed) Editorials. (N) Technical News. (P) Perspective. (PD) Product Design. (PV) Points of View. (RS) Reference Book Sheets. (SP) Significant Parts. (T) Trends in Appearance Design.

Corrosion-testing methods (A).Oct. 13 143
Crossbow tests reactor resistance to control-rod blowout (N).....Dec. 1 10
Electroplated coatings under test at Bell Labs (D).....Nov. 17 5
Fiberboard with improved flame resistance promised (D).....Aug. 25 8
Future power sources from free radicals (D) .....Aug. 11 5
How to make sound tests at 150 db. M. T. Anderson.....Dec. 22 58
Hypersonic gas gun tests two ways (N) .....Aug. 25 14
Impact resistance at 300F below zero (N) .....Oct. 6 11
Is your engineering laboratory still in the race?—Plan '59.....Oct. 6 26
Low-temperature specifications go lower (D) .....Nov. 3 8
Measure tiny spheres by cross-guide coupler (N) .....Sept. 8 24
Multimillion degree temperatures measured by Doppler (D).....Sept. 22 10
Noise chamber for testing 150-db (N) .....Dec. 29 26
Nondestructive testing symbols (DD) .....Mid-Sept. A12
Polaris testing—"Product Engineering" goes aboard ship to see it done (N) .....Dec. 22 23
Polystyrene models speed design tests for investment casting (N)..Sept. 1 22
Pressure meter to test high-viscosity plastic resin (D).....July 28 8
Refrigerant lubricant qualities under study (D) .....Oct. 20 5
Rolled beryllium sheets tested for Air Force (N) .....Sept. 8 26
Russia reaches 5 million atmospheres (D) .....Sept. 22 8
Shorts are short-circuited by electronic tube-tester (D) .....Aug. 4 19
Standardized method for testing insulation resistance of printed-circuit boards (D) .....Nov. 24 22
Thermal shock test for glassed coatings (N) .....Sept. 8 14
Transistor tester (D).....Nov. 17 5
Ultrahigh pressures change material characteristics (N) .....Dec. 15 10
Ultralow temperature research goes into high gear (N).....Sept. 8 10
Viscous liquid streams to simulate fiber structure (N) .....Aug. 25 10
What you need for a better engineering laboratory. R. W. Carson...Oct. 13 66
Wind tunnel to investigate the problems of high-speed flow of particle-contaminated gases (N).....Nov. 17 21
Wind tunnel without pumps or fans (N) .....Aug. 25 19
World getting together on standardized testing (N) .....Nov. 24 27

Textiles
Bonded fibers—coming up fast (N) .....Nov. 3 12
Glass and ceramic fibers—they beat the heat. T. D. Callinan.....July 7 70
Liscous liquid streams to simulate fiber structure (N) .....Aug. 25 10
New fibers—glossary (N).....Aug. 25 11
Vinylon fiber from Japan (D)..Aug. 25 8

Timers
Clocks now wound by heat (PD) .....Oct. 27 57
Design for time—the revolution in watch design of the past decade .....Nov. 3 28
Integrally powered timer (SP)..Nov. 10 101

Titanium
New hardenable titanium (N)..July 7 23
New hardenable titanium—report. R. W. Carson.....July 21 68
New titanium alloy with strength at 1100 to 1500 F (D).....Nov. 3 7
Solder for titanium (D).....Dec. 8 28
Titanium and zirconium at half the cost (N) .....Sept. 22 12
Titanium at temperature. H. R. Ogden (DD) .....Mid-Sept. B2
Turn titanium to efficient use in fighter aircraft (N) .....Oct. 6 16

Tolerances
Form and position tolerances (A) .....Sept. 15 149

Transducers
Adjustable pressure transducer (SP) .....July 21 89
Optical transducer (SP) .....Dec. 15 35
Thermal transducer reduces temperature fluctuation (N) .....Oct. 27 24
Water-cooled pressure pickup (SP) .....Aug. 25 30

Transistors
Average price will drop (D)....Aug. 4 20
Operation of the intrinsic-barrier transistor. J. M. Early (DD)..MidSept. M14
Producers aiming at frequencies of about 1,000 mc, ambient temperatures to 750 F, and power capability of at least 200 w by 1961 (D)..July 7 18
Transistor tester (D) .....Nov. 17 5
Transistor types—a glossary of terms (N) .....Nov. 17 10
UHF transistor to be produced commercially (N) .....Dec. 15 34

Transmission, Mechanical
Speed-reduction pulley (D) ....Dec. 8 37

Tubing
Tooling for development (A)....Sept. 1 76

—V—

Vacuum Melting
Vacuum gives top-quality metals. L. W. Johnson .....Aug. 18 72

Valves
Ball cam-actuated valve (SP).Sept. 15 105
Design changes foreshadowed by changes in aircraft fuels (D) Nov. 24 21
Electrohydraulic valves (SP)..Sept. 22 42
Infinitely-variable lubricant valve (SP) .....Oct. 13 103
Modifying valve characteristics. G. L. Roth (DD) .....Mid-Sept. J6
Momentary converter valve (SP) .....Oct. 13 103
Novel exhaust valve (D) .....Aug. 4 20
Power manual brake valve (SP).July 7 81
Regulator programs pressure systems (SP) .....Sept. 1 55
Split-flapper check valve (SP).Sept. 15 105
Steady-state axial flow forces on pneumatic spool-type control valves Tsun-Ying Feng (DD) .....Mid-Sept. J9
Thin solenoid valves (SP).....Aug. 18 87

Variable Speed Drives
Resistor smooths lift-truck drive (PD) .....Aug. 4 47

Vibration and Shock
Cadillac uses accumulator principle in '59 shock absorbers (PD)....Oct. 13 80
Data on vibration-damping capacity (D) .....Nov. 24 21
Equating fibration service conditions with testing procedures (A)..Oct. 27 100
Internal vibration is key to nondestructive system devised in France (D) .....Oct. 27 19
Lashing paperboard to tank's underside absorbs shock from an airdrop (N) .....July 21 23
Torsional vibration measured by strain gage (D) .....Oct. 20 8
Vibration isolators with zero stiffness—a foreign digest (DR) .....Sept. 29 52

—W—

Water Supply
Salt water goes fresh as pilot plants test conversion theories (N)..Oct. 13 39
Sea water conversion to get more funds (D) .....Aug. 25 6

Welding
Design for welding (A) .....Oct. 13 143
Magnetic-force welding. F. R. Park. .....Sept. 15 82
Metal foil improves welding (N) Sept.15 40
Titanium for efficient use in fighter aircraft by spotwelding in composite construction (N) .....Oct. 6 16
Ultrasonic welder (N) .....Dec. 29 25
Welder for light-gage metals (SP) .....Oct. 27 69
Welded joint design (A) .....Aug. 18 116

ORGANIZATIONS

Acrolite Products, Inc.—Gear lubricant deposits web rather than film (N) .....Sept. 8 14
Adhesive Products Corp.—Dry-bonding adhesive (SP) .....Dec. 1 31
Aerojet-General Corp.
F-104 gets infrared fire control system (N) .....Sept. 22 32
Future power sources from free radicals (D) .....Aug. 11 5
Plastic bond for missile casing (D) .....Oct. 20 7
Pump materials designed for ultralow temperatures (N) .....Aug. 25 11
Shipbuilding program poses design problems (N) .....Aug. 18 23
Underwater cargo vessel (N). Sept. 29 22
Aeroprojects Inc.—Ultrasonic welder (N) .....Dec. 29 25
Aeroquip Corp. Marman Div.—Lightweight rotation joints (SP)..Dec. 22 71
Air Material Command—Rolled beryllium sheets tested for Air Force (N) .....Sept. 8 26
Air Pollution Foundation—Smog study (N) .....Nov. 10 40
Air Reduction—Licenses vinylon production process (D) .....Aug. 25 8
Air Research and Development Command—Alloys of vastly dissimilar metals (D) .....Sept. 8 5
Solar-energy converters (D) .....Nov. 10 35
AiResearch Manufacturing Company—Small gas turbine. Hans Ziebarth. .....Aug. 4 38
Aladdin Laboratories, Inc.—Tubular friction lock (SP) .....Nov. 3 32
Allied Chemical Corp., Barrett Div.—Comparison of phenolic and polyester premix materials. Colao & Gurvitch (DD) .....Mid-Sept. C12
Allied Chemical Corp., Plastics and Coal Chemicals Div.—Kinsella, T. J., says Russians not far behind in plastics (N) .....July 21 22
Allis-Chalmers Mfg. Co.
Curve fitting. T. R. Hoffman (DD) .....Mid-Sept. A15
Encapsulated motor stator (SP).July 21 89
Fuel cell research (N).....Nov. 3 10
Limited end float couplings for motor applications. Mills & Petermann (DD) .....Mid-Sept. E6
Aluminum Co. of America—New aluminum alloys and fabrication methods (D) .....Aug. 11 8
Aluminum Limited
Lower-cost extrusions (D)...Dec. 29 28
New aluminum alloys and fabrication methods (D) .....Aug. 11 8
American Bosch Arma Corp.—Perelle, Charles W. (PV) .....Aug. 25 28
American Bosch Arma Corp., Arma Div.—Combined techniques cut drafting time, tedium (N) .....Dec. 22 25
American Electronic Products Co.—Flexible terminal blocks (SP)....July 28 34
American Felt Co.—Synthetic felt seal (SP) .....Sept. 15 105
American Institute of Electrical Engineers
Machine-tool conclave (N) ....Nov. 3 21
Machine-tool designers announce new control developments (N)....Oct. 27 25
American Iron and Steel Institute—The right finishes for stainless steel. R. E. Paret (RS) .....Oct. 13 99
American Latex Products Corp.—Best recipe for casting urethane foam .....Nov. 10 86
American Lava Corp.—Ceramics that are ductile (SP) .....Aug. 11 37
American MARC Inc.—Cast rotor simplifies generator (PD) .....Sept. 1 42
American Machine & Foundry Co.
Battery that carries its own built-in heater (D) .....July 7 17
Hastings, George S. (PV).....Oct. 20 29
Titan launcher (N) .....Dec. 29 25
American Motors Corp.
Chapin, Roy D. Jr. (PV).....July 28 32
New day arriving in US Car design (N) .....Sept. 29 26
American Ordnance Association—Hear pleas for informal R&D (N)..Dec. 15 22
American Smelting and Refining Co.—Strong, ductile zinc foil (D)..Oct. 6 5
American Society of Industrial Designers—Annual meeting (N) .....Nov. 3 20
American Society of Lubricating Engineers—Papers from the 1958 Annual
American Silver Co.—Composite metal (SP) .....Dec. 29 31
Meeting, Cleveland (A).....July 7 110
American Society of Mechanical Engineers—Papers from the Semiannual Meeting, Detroit (A).....Aug. 4 90
American Stearin Co.—Anti-yellowing agents (D) .....Oct. 27 20
American Viscose Corp.—Foreign patents—nuisances or nuggets" Worth Wade .....Dec. 15 27
Anaconda Co.—New flexible sheeting for electrical use (D) .....Dec. 29 27
Apparatebau Stellingen (Germany)—Tape dictation machine (T).....Nov. 17 39
Applied Science Corp.—Develops high accuracy electronic commutator (N) .....Aug. 11 28
Argonnne National Laboratory—Injection casting (D) .....Oct. 13 36
Armour Research Foundation—Cemented borides show promise (D) ...Nov. 10 36
Armstrong Cork Company—Flange design and gasket selection. E. M. Smoley (DD) .....Mid-Sept. F2
Army Engineer Research and Development Laboratories—More power per pound in new tractors (N)..Sept. 22 29
Army Quartermaster Research and Engineering—Design fast-opening parachute (N) .....Sept. 22 24
Associated Spring Corp.—Preassembled spring washers (SP).....Aug. 25 30
Association for Applied Solar Energy—Solar heat experiment may lapse—no money (N) .....Sept. 22 30
Association Internationale des Constructeurs de Materiel Aeronautique—Hot water key to supersonic wind tunnel (N) .....Sept. 22 29
Association of Casualty and Surety Companies—Uranium handling—a problem in fire prevention (N)....July 28 12
Atlas Copco AB—Coiling the cooler saves water (PD) .....Dec. 22 54

(A) Abstract. (D) Developments. (DD) Design Digest. (DS) Design Roundup. (Ed) Editorials.
(N) Technical News. (P) Perspective. (PD) Product Design. (PV) Points of View.
(RS) Reference Book Sheets. (SP) Significant Parts. (T) Trends in Appearance Design.

Lower prices for nylon industrial fiber (D) .....Dec. 22 21
Ford Motor Co. Tractor and Implement Div.
Fuel cell research (N).....Nov. 3 10
General Mills—Electrostatic separator for

Atomic Energy Commission
Custom-tailored ceramics (D)..Dec. 8 37
Heat-transfer media—new information available (N) .....Dec. 1 12
Heavy water available at $28 a pound (N) .....Aug. 25 10
Irradiated gases are new material source (N) .....Oct. 6 10
Monitoring system for controlling dangerous gases (D) .....Oct. 13 36
Outlines isotope uses (N) .....Sept. 22 30
Project names for the atom (N).Dec. 1 10
Probes radiation (N) .....July 7 21
Stanford Research Institute will maintain classified-documents depository (N) .....July 28 24

Atomic Energy Commission's Mound Laboratory—Thermoelectric generator with nuclear battery (D)..Aug. 11 5

Atomic Weapons Research Establishment (Britain) — Pressureless sintering process produce high-density powdered metal (D) .....Sept. 22 8

Australia's Defense Standards Laboratories—Pure chromium need not be brittle (D) .....Sept. 8 8

Austrian Foundry Institute—New Aluminum alloys and fabrication methods (D) .....Aug. 11 8

Automatic & Precision Mfg. Co.—High-pressure shaft seal (SP)....Oct. 20 30

Automatic Telephone & Electric Co.—Stop-light stopper (N) .....Dec. 29 28

Automatic Transportation Co.—Magnets assist in fork lift trucking of 10-ton tinplate coils (N) .....Sept. 15 40

Automobile Manufacturers Assoc.—Williams, Harry A. (PV).....Dec. 15 22

AVCO, Research and Advanced Development Div.—How to make sound tests at 150 db. M. T. Anderson..Dec. 22 58

Aviation School of Medicine—Spaceship oxygen sensor (N) .....Nov. 17 21

Avro Aircraft Ltd.
Cancellation of Arrow seen as jolt to future R&D (N) .....Oct. 27 22
The secret saucer (N) .....Dec. 15 18

Badger Meter Mfg. Co.—Remote registering counter (SP) .....Dec. 22 71

Baker Perkins, Inc.—New twist to twisting trick (PD) .....Sept. 15 91

Baker Perkins Inc., Chemical Machinery Div.—Stacking the components simplifies assembly (PD).....Dec. 8 94

Barry Controls Inc.—How much stress on a bearing ball? J. E. Ruzicka (RS) .....Nov. 10 97

Battelle Memorial Institute
Chromium-silicon films—resistive elements of new design (D).....Sept. 15 36
More carbide coatings (D) .....Oct. 27 19
Titanium at temperature. H. R. Ogden (DD) .....Mid-Sept. B2

Beckman Instruments Inc., Helipot Div.—Subminiature servomotor (SP) .....Nov. 10 101

Beck's Inc.—Imbedded printed circuits (SP) .....Nov. 10 101

Bell & Howell Co.—First fully automatic still camera (N) .....Nov. 10 39

Bell Telephone Laboratories, Inc.
Blueprint specifications for cleanliness (D) .....Sept. 15 35
Conductive and resistive coatings. R. J. Phair (DD) .....Mid-Sept. D8
18 electroplated coatings (D)....Nov. 17 5
Microfilm pushes drawings aside. W. J. Locke .....Oct. 27 44
Transistor price will drop (D)..Aug. 4 20

Bell Telephone Laboratories, Metallurgical Research—Soldering aluminum—a simple fluxless technique. Bouton & White (DD) .....Mid-Sept. G10

Bell Laboratories Solid State Device Development—Operation of the intrinsic-barrier transistor. J. M. Early (DD) .....Mid-Sept I14

Bendix Aviation Corp., Eclipse-Pioneer Div.—Passport to tomorrow . . . For a complex project . . . these three remedies .....Dec. 28 8

Bendix Aviation Corp.—Industrial Controls Div.—Tape searcher (SP) .....Dec. 15 35

Bendix Aviation Corp., Research Laboratories Div.—Kock, Dr. Winston E. (PV) .....Oct. 20 28

Beryllium Corp. of America—Calcium metal headed for new product applications (N) .....Sept. 22 12

Bethlehem Apparatus Co.—Controlled heat—a new gas-oxygen lab burner (N) .....Oct. 6 10

Bjorksten Research Laboratory—Foamed aluminum (D) .....July 21 17

Bjorksten Texas Research Co.—Scratch-resistant, transparent acrylic plastics (D) .....Sept. 1 20

Blasi, A. G. (Switzerland)—Pneumatic clamp for machine tools (D). Aug. 18 17

Bliss, E. W. Co.—Better strip from metal powders (N) .....Sept. 22 12

Boeing Airplane Co.
707 cuts noise with multi-tube extension (N) .....Oct. 6 19
Step bearing . . . a new concept in air lubrication. C. R. Adams...Dec. 8 96

Boeing Airplane Co.'s Industrial Products Div.—Single-stage compressor gas turbine (N) .....July 28 21

Boelkow Entwicklungen, K. G.—Simulated helicopter with real rotors and controls (PD) .....July 21 71

Bolt, Beranek & Newman, Inc.—Alloys of vastly dissimilar metals (D)..Sept. 8 5

Booker-Cooper Inc. — Sintered bronze bearing (SP) .....Oct. 6 35

Borg-Warner Corp., Rockford Clutch Div.—Inverted leved operates spring-loaded clutch assemblies (SP)..Oct. 6 35

Borg-Warner Corp., Wooster Div.—Self-contained hydraulic power package (SP) .....Oct. 27 69

Bostitch Inc.—More work for the busy staple. H. G. Allen (DR)....Dec. 8 108

Braun, (Max) Works—Table model radio-phonograph (T) .....Nov. 17 28

Britain's Ministry of Supply—Voice-actuated equipment (D) .....Oct. 6 8

Britain's Tin Research Institute—Tinned castings by "direct-chloride" process (N) .....Dec. 1 12

British Broadcasting Corp.—Automatic channel-switcher (D) .....Sept. 22 8

British GE Laboratories—Ultra-pure copper (D) .....Nov. 3 8

BP Tanker Co.—Hydraulic fenders for ships (N) .....Sept. 15 39

British Steel Castings Research Assn.—Magnetic properties of cast steel (D) .....Nov. 17 8

Bryce Berger Ltd.—New engine governor (D) .....Sept. 29 19

Bueroma Gmbll — Bench-size paper shredder (D) .....Dec. 15

Buhr Machine Tool Co.—Electronic finger checks drills (PD) .....Aug. 4

Bureau d'Etudes Techmes—French design—motion picture projector; hand drill (T) .....Sept. 8 34

Burndy Corp.—Modular terminal block (SP) .....Dec. 1 30

Burroughs Corp.
Detroit P. O. to get first automatic mail sorter (N) .....July 28 20
High-speed teleprinter (D) .....Dec. 8 38

California Research Corp.—Non-petroleum lubricants (D) .....Oct. 13 36

Callery Chemical Co.—Better gasolines and new preservatives (D)...July 21 18

Canadian General Electric Co., Ltd.—For better electroplating. P. C. Noy (DR) .....July 7 74

Canadian National Railways—First all-aluminum railway refrigerator car (N) .....Nov. 24 25

Cannon-Muskegon Corp. — New super alloy bids for hot jobs. Iverson & Bachman .....July 21

Capitol Products Corp. — Dome-shaped building (T) .....Sept. 22 27

Case Institute—Plans research guide (N) .....Nov. 24 24

Case, J. I. Co.—Today's plowshares: bigger, more versatile (N)...Aug. 11 91

Carpenter Steel Co.—Alloy gains stressed parts (SP) .....Dec. 15 35

Caterpillar Tractor Co.—Jass, J. E. (PV) .....July 28 32

Catholic University of America—What you should know about designing for reliability. Dr. D. N. Chorafas .....Nov. 10 76

Chamberlain Industries Ltd., Staffa Works—Radial-piston hydraulic motor (D) .....Dec. 1 8

Chance Vought Aircraft Corp.
Shorts are short-circuited by electronic go-no-go tester (D) .....Aug. 4 19
Turn titanium to efficient use in flatter aircraft (N) .....Oct. 6 16

Charbonneaux, Philippe (France)—Television set's tube swivels (T)..Sept. 8 35

Chase-Walton Elastomers, Inc.—Silicone rubber sponge. J. C. Walton..Aug. 4 54

Checker Motor Corp.—Superba to bow in January (N) .....Nov. 24

Chiksan Company
Designing with swivel joints. G. M. Bagnard .....Dec. 8 100
Swivel joints. G. M. Bagnard (RS) .....Dec. 22 67
Swivel joints may work where nothing else can. G. M. Bagnard.....Aug. 4 40

Chrysler Corp.
Electronic rearview mirror (N) .....Sept. 22 23
'59 engineering features (PD). Oct. 13 81
Swivel chairs in cars (N) .....Sept. 8 23

Chrysler Corp. Amplex Div.—Iron powder metal bearings (SP).....Nov. 17 41

Chrysler Corp. Dodge—Royal Lancer (N) .....Oct. 13 39

Cincinnati Industries Inc.—Polystyrene paper laminate is heat formed (D) .....Dec. 29 28

Cincinnati Milling Machine Co., Metal-Dynamics Div.
Cams drive steel-squeezing dies (PD) .....Dec. 8 95
Internal splines swaged (D) ...Nov. 24 22

Cincinnati Milling Machine Co., Special Machine Div.—Stugard, Carl F. (PV) .....Nov. 3

City College of New York—Method of finite differences. Shaffer & Krause .....Oct. 13

Civil Aeronautics Administration—Air traffic control plan gets first compute (N) .....Sept. 29

Clark Electronic Laboratories — Clark, Dudley B. (PV) .....Sept. 22

Clark Equipment Co., Industrial Truck Div. — Resistor smooths lift-truck drive .....Aug. 4 47

Cochran Foil—New Flexible sheeting for electrical use (D).....Dec. 29 27

Coleman Engineering Co. — Test sled breaks up (N) .....Aug. 11 27

Columbus Electric Mfg. Co.—Low-force snap switch (SP).....July 28 34

Comet Rice Mills—Rust preventives and lubricants from rice oil (D)..Dec. 22 22

Commonwealth Scientific & Industrial Research Organization — Thermal transducer reduces temperature fluctuation (N) .....Oct. 27 24

Commonwealth Scientific and Industrial Research Organization, Div. of Physics—New optical elements based on spherical aberration (D)... Oct. 6 8

Compaco Inc.—Automatic color control (SP) .....Nov. 3 33

Compagnie de L'Esthetique Industrielle—Re-designed gas diesel tractor (T) .....Sept. 8 34

Compania de Aviacion, S.A.—New copter tail rotor has variable speed (N) .....Oct. 20 18

Consolidated Controls Corp.—Herringbone and gimbal compression springs (SP) .....Dec. 29 31

Consolidated Electrodynamics Corp., Datalab Div. — Tape recorder — many speeds but no reel (PD).....Dec. 8 92

Consolidated Freightways—Far-reaching changes in brake design (D)..Oct. 13 36

Continental Diamond Fibre Corp.—Plastics for the 3500 F range (D)..July 21 18

Coors Porcelain Co.—Ceramic sponges to sop up wastes (N) .....Dec. 15 10

Cornell Aeronautical Laboratory
Building test apparatus for small rotorcraft, may replace costly wind tunnels (N) .....Nov. 10 40
Experiment seeking to improve design of high speed missiles (N)...Aug. 11 22

Corps of Engineers R&D Labs.—Portable firefighter (N) .....Dec. 8 39

Creators, Ltd.—Wire harnesses made from plastic coils (D) .....Sept. 8

The Cross Co.—Cross, Ralph E. (PV) .....Nov. 3 30

Crucible Steel Co. of America
New hardenable titanium (N)..July 7 23
7 closer looks at metal properties. Edward Loria .....Oct. 27 48

Cummins Engine Company, Inc.—Diesel engine fuel economy. J. C. Miller (DD) .....Mid-Sept. H9

Curtiss-Wright Corp. — Front-end jet noise reduced (N) .....Oct. 6 19

Curtiss-Wright's Research Div.—Solder for titanium (D) .....Dec. 8 38

Daimler-Benz AG — Unimog — truck sprouts power take-offs (PD.) Aug. 18 64

Daubert Chemical Co.—Transparent film with corrosion-inhibiting coating (D) .....Oct. 27 20

Dayton Malleable Iron Co., Ironton Malleable Div.—Pearlitic malleable castings. O. K. Hunsaker (DD)..Mid-Sept. D7

Dayton Rubber Co.—Dacron will be standard reinforcement in V-belts (D) .....Dec. 29 27

DeHavilland Aircraft of Canada, Ltd.—Calculate gyroscope precession torques. A. E. Maine (DD) .....Mid-Sept. H8

Delron Co.—Structural fastener (SP) .....Sept. 22 42

Densmore Engineering Co., Inc.—Hydraulic cylinder stroke (SP)..Dec. 22 71

Denver Metals & Chemicals Corp., Barr Machine & Tool Div.—Compression fastener and bushing (SP). Oct. 13 103

Denver & Rio Grande Western Railroad—More power from conventional fuels (D) .....Oct. 27 19

Detroit Edison Co.—Leahy, S. F. (PV) .....Sept. 8 32

Detroit Power Screwdriver Co.—Power screwdriver (T) .....Aug. 25 26

Detroit Controls Corp. — Temperature measurement in solids. Gledt & Rall .....July 21 65

Diamond Ordnance Fuze Laboratories—Switch-time nomograph. T. A. Prugh (DD) .....Mid-Sept. I19

Dietz Henry G. Co., Inc.—Air-filter gage (SP) .....Dec. 8 115

Doak Aircraft Co.—Army's new Doak 16 VTOL aircraft (N) .....Nov. 17 19

Donnelly-Kelley Glass Co.—Abrasion protection for glass (D) .....Aug. 18 18

Douglas Aircraft Co.
Airlift may compete with surface transport (N) .....Aug. 4 25
Airplane seats with service facilities built into the backs (PD)...Sept. 15 88
Cast urethane rubber for tail wheels (N) .....Nov. 24 23
DC-8 exhaust will be muffled (N). Oct. 6 18
Estimations of resonant frequency of hydraulic actuators. B. C. Moore (DD) .....Mid-Sept. J5

Dow Chemical Co.
Are you creative?—ask your wife. Dr. J. H. McPherson .....Nov. 17 28
Clear anodize for magnesium (SP) .....Nov. 24 81
Heat-stable epoxy resin (SP)..Dec. 29 30
How to calculate stresses in press-fit bushings. E. H. Schuette (RS) .....Sept. 1 51
Trycite, new plastic film (D)....July 7 18

Dow Corning Corp.—Hydraulic fluids for continuous service (D)...Sept. 22 5

Du Pont E. I. De Nemours & Co.
Delrin—new plastic for instrument panels (N) .....Nov. 3 12
Industrial air conditioning—what users think of it (D).....Sept. 8 5

Hoffman Electronics Corp.—Talking machines (D) .....July 7 18

Hoover Electric Co. .....

Landau, J. & Co., Inc.—Coating permits machining (SP) .....Nov. 3 33

Meriam Instrument Co.—Sensitive pres-

(A) Abstract. (D) Developments. (DD) Design Digest. (DS) Design Roundup. (Ed) Editorials.
(N) Technical News. (P) Perspective. (PD) Product Design. (PV) Points of View.
(RS) Reference Book Sheets. (SP) Significant Parts. (T) Trends in Appearance Design.

Lower prices for nylon industrial fiber (D) ..... Dec. 22 21
Manganese-steel parts doubled in strength (D) ..... Dec. 15 5
Mechanical joining of plastics. Cheney & Ebeling (DD) ..... Mid-Sept. G2
Photosensitive plastic sheet (D) . Aug. 4 -0
Du Pont's Petrochemical Div.—A "chemical insulator" for copper (D) . Sept. 8 5
Du Pont's Pigments Research Laboratory—Transparent ferrites aid in magnetism studies (N) ..... Sept. 22 10
Duraloy Co.—Alloy for 1800 to 2300 F (SP) ..... Dec. 29 31
Dychro Corp.—Digital shaft-angle encoder (SP) ..... July 28 34
Dynamic Instrument Co., Inc.—Water-cooled pressure pickup (SP) . Aug. 25 30
Eastman Kodak Company—Optical engineering, research, development. Jack Stolp (DD) ..... Mid-Sept. A5
Edcliff Instruments Inc.—Linear potentiometer (SP) ..... Dec. 1 30
Eisenwerk Hensal—Second flywheel gives double-duty press (PD) ..... Sept. 1 41
Elastic Stopnut Corporation of America—Passport to tomorrow . . . Product planning puts design on the right road ..... Dec. 29 6
Electric Auto-Lite — Transistorized, low-voltage ignition systems (D) . Dec. 22 22
Electric Motors and Specialties—Motor-alternator (SP) ..... Dec. 1 31
Electro Mechano Co.—Air-hydraulic unit (SP) ..... Nov. 17 40
Electronics Industries Association—Dallas conference data-filled (N) . . . Dec. 22 27
Electronic Processes Corp. of Calif.—Temperature control (SP) ..... Dec. 1 31
Elektra GmbH—Electric iron (D) . Aug. 11 8
Elesta, Bad Ragaz, Switz.—Ionization chamber serves as a resistor (D) ..... July 7 17
Elox Corp. of Mich.—Electrochemical machining (SP) ..... Sept. 8 36
El-Tronics, Inc. ALWAC Computer Div.—Numerical control and the design engineer. H. J. Langlie ..... Oct. 20 23
EMI Electronics, Ltd.—Computer has 20 million character storage (N) . Oct. 20 22
Emerson & Cuming, Inc.—Epoxy adhesive for preforms (SP) ..... Sept. 8 36
Emery, A. H. Co.—Low-capacity load cells (SP) ..... Aug. 25 30
Emhart Mfg. Co. Hartford Empire Co. Div.—Light catches glassware defects (PD) ..... Sept. 1 43
Engelhard Industries, Inc. American Platinum & Silver Div.—Bright silver-plating process (SP) ..... Oct. 6 35
Erie Foundry Co.—Shortened press reduces stretch (PD) ..... Nov. 10 82
Esco S. A., Les Geneveys-sur-Coffrane, Switz.—Setup banishes kinks, then machines stock (PD) ..... Sept. 15 90
Esso's Aviation Dept.—Design changes in pumps, valves foreshadowed by changes in aircraft fuels (D) . Nov. 24 21
Esso Research and Engineering Co.—Automated test stand replaces on-the-road driving (N) ..... Aug. 4 25
Esso Standard Oil Co.—Cars that need no grease may be around in 3 to 5 years (D) ..... Dec. 1 5
Establishments Arnault (France)—Open-back panel truck (T) ..... Nov. 3 29
Ethyl Corp.—Manganese organometallics—new anti-wear additives for lubricants (D) ..... Nov. 10 36
Evode, Ltd.—Thixotropic coating (D) ..... July 28 8
Ex-Cell-O Corp.—Eccentricity for accuracy in close-tolerance machining (PD) ..... Aug. 18 66
Fairbanks, Morse & Co.—Guide to selecting polyphase motors. C. C. Libby ..... Aug. 18 58
Fairchild Camera & Inst. Corp.—Whip the backlash in spring clutches. Joseph Kaplan ..... Aug. 18 62
Fairchild Engine & Airplane Corp.—Refrigerant lubricant qualities under study (D) ..... Oct. 20 5
Fairey Aviation Co., Ltd.—Giant miller floats in oil (PD) ..... July 7 61
Fansteel Metallurgical Corp.
Coatings to protect molybdenum and columbium (N) ..... Oct. 20 11
Molybdenum supports for semiconductors (N) ..... Aug. 11 12
Federal Pacific Electric Co.—Christensen, Paul M. (PV) ..... Sept. 8 33
Fiat (Italy)—Torsional vibration measured by strain gage (D) ..... Oct. 20 8
Firestone Tire & Rubber Co.—Improved synthetic rubbers (D) ..... Aug. 25 5
Flight Refueling Inc.—Edge area of bent-up shapes—k-factor will speed answer. S. W. Kaye (RS) ..... Sept. 15 101
Ford Instrument Co.—Contract for no-gimbal inertial guidance system (N) ..... Sept. 1 21
Ford Motor Co.
Automation with quality control built in at Lima, Ohio plant (N) . . . Sept. 8 20
Higher-strength steels on a do-it-yourself basis (D) ..... Nov. 24 21
Rumble in single-cylinder engines. Robison, Behrens & Mosher (DD) ..... Mid-Sept. H2
Trucks switch to ac-dc system (N) ..... July 7 23
Ford Motor Co. Tractor and Implement Div.
Automatic steering for tractors (N) ..... Sept. 15 42
Today's plowshares; bigger, more versatile (N) ..... Aug. 11 19
Formacel Corp.—Automatic machine produces sandwich honeycomb (SP) ..... July 7 81
Formsprag Company — Applications of sprag-type clutches. W. T. Cherry (DD) ..... Mid-Sept. E18
Foster Grant Co.—Strong, transparent nylon film (D) ..... Nov. 10 35
Freightliner Corp.— Improve fifth wheel (N) ..... Sept. 1 21
French National Center of Telecommunications Research—Major breakthrough in electronic amplification (D) ..... July 21 18
Fuller, H. B. Co.—Bonds of over 500psi possible (SP) ..... July 28 34
Furane Plastics, Inc.
Epoxy paste cures underwater (SP) ..... Sept. 8 36
Relationship between properties of epoxy resin. John Delmonte (DD) ..... Mid-Sept. C5
Furnival & Co. Ltd.—Speed-reduction pulley (D) ..... Dec. 8 37
Gagne, A. F. Associates—Plastic-film dust boot (SP) ..... Oct. 27 69
Gardner-Denver Co.— Rotary air motor for fhp (SP) ..... July 7 81
Garrett Corp.'s AiResearch Mfg. Div.
Design all-floated gimbal rate gyro (N) ..... Sept. 29 22
Split-flapper check valve (SP) . Sept. 15 105
Supercharger gives peak power at right time (PD) ..... Oct. 13 82
General Dynamics Corp.
New reactor type to be explored (D) ..... Aug. 4 19
Shipbuilding program poses design problems (N) ..... Aug. 18 23
General Dynamics Convair Div.
Cargo carrying missile that lobs (N) ..... Oct. 27 21
Gas-ram machine opens new fields for metal forming (N) ..... Nov. 10 38
Hypersonic gas gun tests two ways (N) ..... Aug. 25 14
Modifying valve characteristics. G. L. Roth (DD) ..... Mid-Sept. J6
A tonic for tired metal—Why have fatigue problems when it's easier to do without them? C. R. Smith . . . Dec. 1 22
General Electric Co.
Air turbines and generators (D) . Oct. 27 20
Ceramics swaged to shape and metal clad (D) ..... Dec. 1 5
Closed-circuit television system (N) ..... Oct. 6 15
Computers permit new statistical analysis concepts to aid design (N) . Sept. 8 21
Featherweight TV (N) ..... Nov. 10 42
For measuring RPM — which tachometer? H. D. Drage ..... Nov. 10 89
How many planets in an epicyclic gear? R. J. Willis Jr. ..... Nov. 24 57
Key executive seeks more R&D flexibility (N) ..... Aug. 11 28
Miniature-sealed relay (SP) . . . Nov. 17 40
Motor operates at full hp only underwater (SP) ..... Sept. 1 55
Nitrile silicone rubber resists oil at high, low temperatures (N) . . Aug. 18 23
Non-petroleum lubricants (D) . . Oct. 13 36
Prototype 50-amp controlled silicon rectifier (N) ..... Oct. 27 25
Vane-operated limit switch (SP) ..... Aug. 11 37
Vulcan aircraft cannon (N) ..... Nov. 3 17
Wolfe, John K. (PV) ..... Sept. 8 32
General Electric Co. Advance Gear Engineering—How to predict efficiency of gear trains. E. E. Shipley ..... Aug. 4 44
General Electric's Appliance Control Dept.—Contact "bounce" is eliminated by new relay design ..... Dec. 22 22
General Electric Co. Equipment Industries Engineering—Numerical control. Rosenblatt & Dutcher ..... Oct. 27 50
General Electric Co. Gear Engineering—Gear failures related to lubricants. E. E. Shipley (DD) ..... Mid-Sept. E2
GE's Hanford Laboratories — Plutonium recycle reactor (N) ..... Sept. 1 24
General Electric Co. Industrial Heating Dept.—Vacuum gives top quality metals. L. W. Johnson ..... Aug. 18 72
General Electric Co. Industry Control Dept.—Considerations for friction materials. T. W. Driesch (DD) ..... Mid-Sept. C16
General Electric Medium AC Motor and Generator Dept.—Motor that will run full of water (D) ..... Aug. 18 17
General Electric's Missile and Space Vehicle Dept.
Noise chamber for testing 150-db (N) ..... Dec. 29 26
Space rudder uses liquid-filled hoops (N) ..... Dec. 15 10
General Electric's Research Laboratory—Progress in heat-to-electricity conversion (D) ..... July 21 17
General Electric Co. Special Motor Dept.—Before selecting a fhp motor. N. L. Morgan ..... Dec. 22 60
General Electric X-ray Department—Super-bright X-ray TV (N) . . . . Sept. 29 23
General Mills—Electrostatic separator for materials discrimination (D) . Dec. 29 27
General Motors Corp.
Auto parts get weather trials (N) ..... Nov. 17 22
Balanced program for improving drivers, roads and autos recommended (N) ..... Dec. 8 43
1959—new models (N) ..... Sept. 29 24
Predicts aluminum engines, lighter cars (N) ..... Oct. 20 17
Second engine for cars to power accessories (D) ..... Oct. 6 5
General Motors Corp. Buick Motor Div.—Operating principles of fluid couplings for automotive engines. O. K. Kelley (DD) ..... Mid-Sept. E15
General Motors Cadillac — Accumulator principle in '59 shock absorbers (PD) ..... Oct. 13 80
General Motors Chevrolet Div.
Chevy switching to aluminum engines? Here are the clues (N) ..... Sept. 8 19
Impala sport sedan (N) ..... Oct. 13 41
Let's see what's new with Chevy (PD) ..... Oct. 27 58
General Motors, Fisher Body Div.—Develop longer-lasting car paint (N) ..... Sept. 15 37
General Motors Frigidaire Div.—Refrigerator-freezer combination features thermal insulation twice as efficient (D) ..... Aug. 11 5
General Motors Pontiac Div.
Bigger brakes in 1959 model (PD) ..... Oct. 13 80
Double copper bath improves chrome plate (N) ..... July 28 20
1959 Pontiac Bonneville Safari station wagon (N) ..... Oct. 6 15
General Motors Research Staff—Improve method of measuring surface defects (N) ..... Sept. 15 39
General Motors Institute—Industrial report preparation and evaluation. C. L. Tutt Jr. (DD) ..... Mid-Sept. A2
General Nuclear Engineering Corp.—Reactor miniaturization and mechanization may lead to aircraft propulsion (D) ..... Oct. 20 5
General Time Corp. — Pulse counter to rates of 100,000 sec. (D) . . . Oct. 6 5
Georgia Institute of Technology — Thin metal films as corrosion indicators (D) ..... Dec. 22 22
Giannini Plasmadyne Corp.—Deposit any element on a cold base for inexpensive coating (D) ..... Aug. 25 5
Globe Industries Inc.
Miniature dc motors (SP) ..... Dec. 1 31
Stepper motor (SP) ..... Aug. 25 31
Goodrich, B. F.
Aircraft brake system to save weight, wear (N) ..... Aug. 11 20
Pneumatic de-icing system (D) . Aug. 18 17
Goodyear Research Div.—Urethane synthetic rubber tires for industrial trucks (D) ..... Dec. 29 28
Goodyear Tire & Rubber Co.—New rubbers will resist cracking (D) . Sept. 22 5
Gottawaldov Works (Czechoslovakia) — Elevator without cables (N) . . Dec. 22 25
Grace, W. R. & Co.
Polyethylene — flame - retardant compound (N) ..... Sept. 8 26
Silicon metal in new forms (D) . Nov. 17 5
Grace, W. R. Research Div.—Bonded fibers—coming up fast (N) ..... Nov. 3 12
Graham Manufacturing Co., Inc.—Ejectors for suction pressure. F. D. Berkeley (DD) ..... Mid-Sept. J2
Gravity Research Foundation—Design for gravity control—an essay contest (N) ..... Sept. 22 10
Grumman Aircraft Engineering Corp.
Prop-jet executive transport (N) . Sept. 8 24
Shipbuilding program poses design problems (N) ..... Aug. 18 23
Halax Corp.—Nonmagnetic bearing (SP) ..... Sept. 8 36
Halex Corp. — Additives strengthen sintered nylon parts. L. W. Alexander ..... Sept. 15 86
Halocarbon Products Corp.—Noncombustible lubricant (SP) ..... Nov. 3 32
Hamilton Watch Co. Allied Products Industrial Div. — Integrally powered timer (SP) ..... Nov. 10 101
Hancock Industries, Inc. Control Systems Co.— Control panel speeds foreman too (PD) ..... Aug. 4 49
Hannifin Co.—Remote-fill lubricators (SP) ..... Dec. 29 30
Hardy, Charles, Inc. — Calcium metal headed for new product applications (N) ..... Sept. 22 12
Haunstetter, Josef Saegenfabrik — Hand saw (D) ..... Aug. 11 8
Hause Machines — Momentary converter valve (SP) ..... Oct. 13 103
Haynes Stellite Co.— Slip casting . . . its field broadens. L. M. Schifferli Jr. ..... Oct. 13 84
Helical Products Co.—Miniature flexible coupling (SP) ..... Dec. 29 30
Heli-Coil Corp.— Look at wire inserts. H. W. Cram (RS) ..... Sept. 29 55
Herfurth GmbH—Bench-size heat sealer (D) ..... Dec. 15 8
Hickson's of Castleford—Improved flame resistance for fiberboard (D) . Aug. 25 8

(A) Abstract. (D) Developments. (DD) Design Digest. (DS) Design Roundup. (Ed) Editorials
(N) Technical News. (P) Perspective. (PD) Product Design. (PV) Points of View.
(RS) Reference Book Sheets. (SP) Significant Parts. (T) Trends in Appearance Design.

Hoffman Electronics Corp.—Talking machines (D) ..... July 7 18
Hoover Electric Co.— Lightweight intermittent-duty motor (SP) ..... Aug. 25 31
Hopper Machine Works — Today's plowshares: bigger, more versatile (N) ..... Aug. 11 19
Houghton, E. F. & Co—Wiper consists of bladed bronze rings and synthetic mounting ring (SP) ..... Nov. 3 32
Howe & French Inc. — Non-slip epoxy coating (SP) ..... Dec. 15 35
Howe Sounds Corp. Austenal Inc.—Passport to tomorrow...R&D is a product, too! ..... Dec. 29 16
Hughes Aircraft Co.
Name plates for prototypes. W. R. MacKinnon ..... Oct. 13 88
3-D radar has no moving scanner (N) ..... Oct. 27 24
Humphrey, Inc.—Push-rod speed control (SP) ..... Sept. 15 105
Hunt, C. B. & Son, Inc.—Thin solenoid valves (SP) ..... Aug. 18 87
Hunter, James Machinery Co.—Opposed flywheels for smoother feed (PD) ..... Aug. 18 66
Hunting Mhoglas Ltd.—Nonmetal flexible heating element (D) ..... Aug. 11 8
Hurst Tool & Mfg. Co. Inc.—Miniature reversible motor (SP) ..... Nov. 3 32
Hydra-Power Corp.—Power/manual brake valve (SP) ..... July 7 81
Hydronic Co.—Remote-control slave unit (SP) ..... Oct. 13 103
Imperial Typewriter Company, Ltd. — Typewriter for engineers (N) Aug. 18 20
Industrial Electronic Engineers Inc. — Single unit displays 0-to-9 (SP) ..... Nov. 17 41
Institute of Printed Circuits—Printed circuits have a future: their designers, many headaches (N) ..... Oct. 27 23
Integral Ltd.—Hydrostatic chucking device (D) ..... Oct. 13 35
International Atomic Energy Agency — Speeds flow of technical information (N) ..... Aug. 11 27
International Business Machines Corp.
Data processors weighing only 175 lb. (D) ..... Dec. 8 38
Glass and ceramic fibers — they beat the heat. T. D. Callinan ..... July 7 70
International Business Machines Corp. Military Products Div. — Bombsight for the B-70 (N) ..... Nov. 17 26
I B M World Trade Corp. — What you should know about designing for reliability. Dr. D. N. Chorafas Nov. 10 76
International Harvester — Today's plowshares: bigger, more versatile (N) ..... Aug. 11 19
International Nickel Co.—Pilot version of Hickman Still installed at Wrightsville, N C (N) ..... Oct. 13
Interstate Precision Products Corp. — Carpet-sweeper — Swedish-designed (T) ..... Nov. 3 29
Intrex—Fluid and gas sealing (SP) ..... Sept. 22 42
Janeway Engineering Co.—Improved fifth wheel (N) ..... Sept. 1 21
Japan National Railway Corp.—Electric train planned (N) ..... Aug. 11 27
Johns Hopkins' Dept. of Chemical Engineering—Viscous liquid stream to simulate fiber structure (N) ..Aug. 25 10
Johns-Manville Corp.—Improved electrical insulation and pressure sensitive tape promised (D) ..... Dec. 22 22
Jordan Co.—Shaft-mount gear motor (SP) ..... Aug. 25 31
Kaiser Aluminum and Chemical
New aluminum alloys and fabrication methods (D) ..... Aug. 11 8
Why not an all-aluminum car?..Dec. 1 20
Kaiser Aluminum & Sales, Inc.—High strength aluminum alloy. A. B. DeRoss (DD) ..... Mid-Sept. B6
Kaydon Engineering Corp.—World's largest ball bearing (N) ..... Dec. 22 24
K-D-G Instruments Ltd.—Liquid-level switch (D) ..... Dec. 22 21
Kearfott Co.—Rare-earth garnets—magnetic materials come to market (N) ..... Oct. 20 11
Kearney and Trecker Corp. Servo Machine Tool Div.—Tape-controlled machine (N) ..... Oct. 7 25
Kelsey-Hayes—Magnesium wheels for cars and trucks? (D) ..... Dec. 8 37
Kidde, Walter & Co. Inc.
Curves find bending and torsion strength of thin-walled cylinders. Irene Kusmiss (RS) ..... July 21 85
Curves find compression strength of thin-walled cylinders. Irene Kusmiss (RS) ..... July 7 77
Passport to tomorrow . . . Three steps to new products and shorter lead times ..... Dec. 29 22
Kleinschmidt Laboratories—High-speed typing perforator (D) ..... Sept. 8 5
Knowlton Bros.—Nylon-impregnated paper (SP) ..... Sept. 22 42
Koppers Company, Inc.—Plastic piston rings for nonlubricated applications. Taber & Robbins (DD) ....Mid-Sept. F7
Krupp-Addelt (Germany)—Harbor crane (T) ..... Nov. 17 38
KSM Products—Welder for light-gage metals (SP) ..... Oct. 27 69
Kurashiki Rayon—Vinylon fiber (D) ..... Aug. 25 8
Landau, J. & Co., Inc.—Coating permits machining (SP) ..... Nov. 3 33
Landers, Frary & Clark—Ambler, E. C. (PV) ..... Dec. 15 33
LeBlond, R. K. Machine Tool Co.—Progress in lathe design (N)..Aug. 4 23
Le Coultre Watches, (Switzerland)—Clocks now wound by heat (PD) ..... Oct. 27 57
Lectronics, Inc.—Ratchet-drive rotary solenoid (SP) ..... Oct. 13 103
Lessells and Associates, Inc.—Which type of torque-limiting devices? Bareiss & Brand ..... Aug. 4 50
LeTourneau, R. G. Inc.
Earthmover-scraper (N) .....Oct. 6 15
Earthmovers still get larger (N) ..... Nov. 24 25
Largest self-propelled earth-moving scraper (N) ..... Sept. 1 23
Lewis Flight Propulsion Laboratory—Refrigerant lubricant qualities under study (D) ..... Oct. 20 5
Librascope, Inc.—Square-root integrator (SP) ..... Aug. 18 87
Likhachjov Automobile Works—Moscow's bus built like ours (PD) ..... Aug. 4 48
Link-Belt Co.—Quadruple reduction drive (SP) ..... Aug. 18 87
Little, Arthur D., Inc.
Application of solar furnaces. P. E. Glaser (DD) ..... Mid-Sept. A14
How to organize for technical development (N) ..... Oct. 20 16
Let someone else develop and license your invention (N) ..... Oct. 6 15
Progress in magnetic refrigeration (D) ..... Dec. 15 5
Lockheed's Missile Div.
Contact-free variable resistors, multipole relays (D) ..... Nov. 24 21
Kingfisher target missile (N)...Sept. 1 26
Measure tiny spheres by cross-guide coupler (N) ..... Sept. 8 24
Loewy-Hydropress—Vanguard launching troubles denied (N) ..... Sept. 15 42
Loewy, Raymond Associates Inc.—Farm tractor (T) ..... Nov. 3 29
Los Alamos Scientific Laboratory
Ceramic sponges to sop up wastes (N) ..... Dec. 15 10
Nuclear reactor for rocket propulsion (N) ..... Sept. 1 23
Plasma thermocouple promises economical energy conversion (N) ..... Dec. 1 10
Lucent Products Ltd.—Two heat-resistant polystyrenes (D) ..... Oct. 6 8
Ludlow Paper, Inc.—Foam film used as medium-gage sheeting (D)...Aug. 25 5
Mack Trucks Inc.—Gears provide knuckle power for truck's front-wheel drive (PD) ..... Dec. 22 55
Magnesium Association—14th annual convention—makers eye car market (N) ..... Nov. 10 39
Mallory-Sharon—New titanium alloy with strength at 1100 to 1500 F (D) ..... Nov. 3 7
Manheim Manufacturing and Belting Co. —Flat belts for adjustable-pitch pulleys. R. G. Prouty ..... Oct. 27 59
Mankowitz & Strasser Ltd.
14 adjusting devices. Federico Strasser (DR) ..... Oct. 27 62
10 universal shaft-couplings. Federico Strasser (DR) ..... Aug. 18 80
13 handy lever mechanisms. Federico Strasser (DR) ..... Sept. 15 98
20 simple locking devices. Federico Strasser (DR) ..... Dec. 22 64
Mantec, Inc.—Packaged laboratories for environmental testing (N)...July 28 55
Manzel—Lubrication alarm system (SP) ..... Sept. 29 59
Marotta Valve Corp.—Regulator programs pressure systems (SP) .Sept. 1 55
Martin Co.—Tests impact resistance at 300 F below zero (N) ..... Oct. 6 11
Martin Company Nuclear Div.—Metallurgists think iron-aluminum alloys can take the place of stainless steels (D) ..... Sept. 1 20
Mason Instrument Co.—Monitors heat, or counts (SP) ..... Oct. 6 35
Massachusetts Institute of Technology
Design of experiments. E. R. Schwarz ..... Sept. 22 34
New techniques revealed at West Coast lubrication conference—16 papers presented at ASLE/ASME Lubrication Conference. Ernest Rabinowicz ..... Nov. 10 84
Reactor goes critical (N) ..... Sept. 1 24
Master Specialties Co.—Indicator light rotates (SP) ..... Dec. 8 115
McMillan Industrial Corp.—Making money with patents is tough—but not impossible. R. G. Crooks..... Nov. 3 24
Mead Specialties Co.—Miniature noise muffler (SP) ..... Dec. 1 31
Measurements, Ltd.—Filter elements at ⅛ the cost (D) ..... Sept. 22 8
Mechanisms Co.—Pump powers truck wheel (PD) ..... Nov. 10 83
Mechanite Metal Corp.—More surface polishing . . . less galling. W. H. Moore ..... Nov. 24 63
Meletron Corp.—Miniature pneumatic switch (SP) ..... Dec. 22 71
Mercoid Corp.—Magnet-run mercury switch (SP) ..... Aug. 18 87
Meriam Instrument Co.—Sensitive pressure switch (SP) ..... Dec. 8 116
Metal Hydrides Inc.—Sparking lead-zirconium alloys (D) ..... Oct. 27 20
Metal Improvement Equipment Co.—Screw positions nozzles for shot peening (PD) ..... July 7 62
Metal & Thermit Corp.—Hard, flexible vinyl finish (SP) ..... Nov. 10 101
Metallized Carbon Co.—Self-lubricating bearings (SP) ..... Dec. 15 35
Metals Research & Development, Inc.
Copper strip, edge-bonded to steel (D) ..... Aug. 25 5
Plating process that will coat, but not plug (D) ..... Sept. 1 20
Michigan Chemical Corp.—Rare earths: more and purer (N) ..... Nov. 17 12
Michigan State University
Design of helical springs for minimum values (DD) Hinkle & Morse ..... Mid-Sept. F4
Roberts' Law helps you find alternate four-bar linkages. R. T. Hinkle ..... Oct. 27 54
Midwest Research Institute
Better gasolines and new preservatives (D) ..... July 21 18
Thermally stable laminating resins (D) ..... Oct. 13 35
Miller Dial and Name Plate Co.
Fotofoil ..... Oct. 13 88
Localized solder coating in printed circuits (SP) ..... Oct. 20 30
Miniature Precision Bearings Inc.—Gilbert, Horace D. (PV) ..... Nov. 3 30
MiniTec—Subminiature thermal switch (SP) ..... Dec. 29 31
Minneapolis-Honeywell Regulator Co.
How to find the diameter for true involute form. E. A. Niemann (RS) ..... Oct. 27 65
Steady-state axial flow forces on pneumatic spool-type control valves. Tsun-Ying-Feng (DD) ....Mid-Sept. J9
Minnesota Mining & Mfg. Co.
Clear plastic film (D) ..... July 7 18
More complex parts of graphite (D) ..... Sept. 15 35
Minnesota Rubber Co.—Teflon retaining seals (SP) ..... Aug. 25 31
Mitchell Engineering Ltd.—Steps-up design on sub tanker (N) ..... Sept. 1 25
Mobay Chemical—Polycarbonates stir world-wide interest (D) ..... Aug. 25 8
Modern Industrial Plastics—Blended Teflon components (SP) ..... Dec. 8 115
Monarch Machine Tool Co.—Air-gage type tracer system in lathe (T) ..... Aug. 25 26
Monroe Calculating Machine Co.—Passport to tomorrow . . . Which product design for lowest cost reliability? ..... Dec. 29 12
Monsanto Chemical Co. Plastics Div.— Low-static styrenes (SP) ....Sept. 22 42
Motom Italiana—Engine tranquillized by torsion bars (PD) ..... July 7 62
Motorola's Defense Systems Laboratory—Develop better air computer navigation system (N) ..... Dec. 8 42
Mullard Equipment, Ltd.—Ultrasonic decontaminators for removing radioactive particles (D) ..... Sept. 8 8
NACA Ames Aeronautical Laboratory—Atmosphere entry simulator (N) ..... Aug. 11 22
Naige Company—Polypropylene—new strength and heat resistance (N) ..... Aug. 11 12
Napco Industries, Inc.—Turbo tugboat for airliners (N) ..... Sept. 22 21
Narmco Resins & Coatings—Plastic heat resistance at ultrahigh temperature (N) ..... Nov. 17 12
National Aeronautics and Space Administration—Piles up space projects totalling $343 million (N) ....Aug. 25 15
National Bureau of Standards
Astin, Dr. A. V. says measurement methods retard US design progress (N) ..... July 28 22
Direct-reading viscometer (N) .Aug. 18 22
More R&D on ultra-pure metals urged (N) ..... Dec. 22 27
New resins that resist heat (D) .Sept. 1 19
Nickel-chromium coatings can protect molybdenum (D) ..... Dec. 22 22
Paper and cellulose under study (N) ..... Oct. 6 11
What makes glass? A new theory of glass structure (N) ..... Nov. 17 10
National Cash Register—Photochemical windshields (D) ..... Dec. 1 5
National Fluid Power Association—Meeting (N) ..... Nov. 17 26
National Research Corp.—Solid fuels get ultrafine aluminum powder as a thrust booster (N) ..... July 7 21
National Safety Council—Stewart, G. C. (PV) ..... Dec. 15 32
National Science Foundation—6-state science money goes mostly to research and development (N) ..... Sept. 22 22
National Security Industrial Association —Previews government product procurement law (N) ..... Oct. 6 18
National Starch Products, Inc. Structural Products Div.—Water-thinned contact cement (SP) ..... Sept. 29 59
National Vulcanized Fibre Co.—Low-cost, flame-retardant XXXP laminate (D) ..... Oct. 20 5

(A) Abstract. (D) Developments. (DD) Design Digest. (DS) Design Roundup. (Ed) Editorials.
(N) Technical News. (P) Perspective. (PD) Product Design. (PV) Points of View.
(RS) Reference Book Sheets. (SP) Significant Parts. (T) Trends in Appearance Design.

Navan Products—Seals for hydraulic systems (SP)....July 28 35
Nelson Muffler Corporation—Engine exhaust system noise control. D. G. Thomas (DD)....Mid-Sept. H14
New Britain Machine Co. Lucas Machine Div.—Electronic tracer system (T)....Aug. 25 26
New York University—Method of finite differences. Shaffer & Krause..Oct. 13 77
Norman Hardy Associates—Air-jet-actuated switch (SP)....July 28 35
Norris-Thermador Corp.—Cranston, W. E. (PV)....Dec. 15 33
North American Aviation Corp.
Ejection seat for the X-15 (N)..Nov. 3 19
Forming titanium extrusions. I. J. Wilson (DD)....Mid-Sept. D2
The future of constant-speed drives in aircraft (D)....Nov. 10 36
Sabrejet trainer (N)....Nov. 24 25
North American Aviation, Inc. Autonetics Div.—Removable connectors shown to be reliable (N)....Oct. 27 22
North American Aviation's Rocketdyne Div.
Million-pound-thrust rocket program (N)....Sept. 8 22
Nuclear energy needed for moon trip (N)....Oct. 20 10
North American Philips Co. Inc.—Self-illuminating dials and scales (SP)....Oct. 20 30
Northrop Aircraft Inc.
Aircraft efficiency program studied for wider engineering use (N)....Nov. 10 41
Casting saves $530 (N)....Oct. 27 24
Gaiennie, Bernard (PV)....Nov. 3 31
Northrop Aircraft Nortronics Div.
First models of electronic refrigerator (D)....Oct. 6 5
Thermoelectric power-source development (D)....Sept. 22 5
Oak Ridge National Laboratory—At least half a dozen new materials with boron or lithium ready for design evaluation (D)....Dec. 22 21
Ohio State University—Fretting-fatigue failure of titanium-steel and steel-steel joints. Starkey, Marco & Collins (DD)....Mid-Sept. F15
Oilgear Co.—Electrohydraulic valves (SP)....Sept. 22 42
Olin Mathieson Chemical Corp.—Chart analyzes sinusoidal motion. Dr. K. W. Maier (RS)....Nov. 24 77
Olin Mathieson Chemical Corp. Advanced Research and Development Dept.—Drum camera best way to put motion on record. Dr. Karl Maier....July 21 78
Olin Mathieson Chemical Corp. Winchester-Western Div.—Springs that store energy best. Dr. K. W. Maier....Nov. 10 71
Olivetti Corp. of America—Olivetti, Dino evaluates '59 cars....Dec. 1 26
On Mark Coupling, Inc.—Quick-disconnect coupling (SP)....Oct. 6 35
Oregon Metallurgical Corp.
Molybdenum that is workable as-cast (D)....Sept. 22 5
Titanium and zirconium at half the cost (N)....Sept. 22 12
Ormet Corp.—More aluminum from new reduction plant (D)....July 28 5
Owens-Corning Fiberglas Corp.—Papers with high dimensional stability (D)....Aug. 18 18
Pacific Semiconductors Inc.—North, Dr. Harper Q. (PV)....Sept. 8 33
Packaging Institute—New data on working height (D)....Dec. 15 5
Packard-Bell Electronics
Bell, Robert S. (PV)....Aug. 25 29
This tape recorder rides planes (D)....Sept. 1 40
Parametrics — Solid-state proximity switch (SP)....Dec. 1 30
Peerless Motor—Polyester glass moldings form body of Gran Tourisme coupe (N)....July 7 21
Penn Engineering & Mfg. Corp.—Self-locking clinching nut (SP)....Oct. 20 30
Perfecting Service Co.—Disposable filter cartridge (SP)....Dec. 1 30
Perkin-Elmer Corp.—This weather reporter goes into orbit (PD)..Oct. 27 56
Permatron Co.—One-coat organic finish (SP)....Sept. 1 55
Pfaudler Co.—Thermal shock test for glassed coatings (N)....Sept. 8 14
Pfauter (Germany)—Gear hobber (T)....Nov. 17 38
Phillips Chemical Co.—Stronger, more abrasion-resistant rubber products (D)....Aug. 4 20
Pittsburgh Corning Corp.—Acid-resistant insulation (SP)....July 28 35
Pittsburgh Plate Glass Co.—"Safety tube" eliminates front windows for TV sets (D)....Aug. 18 18
Plymouth Cordage Co.—Polypropylene rope (N)....Aug. 11 12
Polytechnic Institute of Brooklyn—Photochemical storage batteries (D)....Nov. 24 22
Porcelain Enamel Institute—New look in porcelain enamel. W. E. Pierce....Nov. 24 52
Portage Machine Co.—Redesigned horizontal milling, drilling and boring machines (T)....Aug. 25 26
Potter and Brumfield — Money-saving electromagnetic relays. Ralph Probert....Nov. 24 66
Potter Instrument Co. Inc. Magnistor Corp.—Magnetic control component (SP)....Nov. 3 33
Pratt Institute—Kolli, Robert evaluates '59 cars....Dec. 1 26
Precision Metalsmiths, Inc.—Polystyrene models speed design tests for investment casting (N)....Sept. 1 22
Precision Welder and Flexopress Corp.
Magnetic-force welding. F. R. Park....Sept. 15 82
Metal foil improves welding (N)....Sept. 15 40
Pre-Flite Industries Corp.—Packaged air starts turbines (PD)....July 21 70
Presin Co.—Electrical printing counter (SP)....July 21 89
Psychological Research Associates, Inc.
Research management . . . a problem in personalities. Peters & Michelson....Sept. 8 30
Selector-switch knobs. G. A. Peters....Dec. 8 103
Pure Oil Co.—Motor oil can't be restored (D)....July 7 17
Purolator Products Inc.—Porous-metal filter elements (SP)....Nov. 17 40
Pye Ltd.—Overspeed and engine-rotation indicator (N)....Sept. 22 21
Pylon Co.—High-strength plastic screws (SP)....July 28 35
Rabinow Engineering Co. Inc.—Rabinow, Jack (PV)....Oct. 20 29
Radio Corp. of America
Changes patent policy; settles with US (N)....Nov. 10 41
Portable color TV system (N)..Sept. 15 38
Semiconductor rectifiers for 750 F service (D)....Nov. 3 5
Thermoelectric power-source development (D)....Sept. 22 5
Transistor producers' aims (D)..July 7 18
RCA Patent Operations—Mitchell, O. V. (PV)....Oct. 20 28
Radioplane—Characteristics of commercially available servo modulators. L. S. Klivans (DD)....Mid-Sept. 110
Rand Corporation—Those heavy presses can cav off. R. W. Smith....Sept. 29 34
Raybestos-Manhattan Inc. Adhesives Dept.—Friction-material adhesives (SP)....Oct. 27 69
Rayonier, Inc.—Lower-cost, weatherproof adhesives (D)....July 28 5
Reed Research Inc. — Explosionproof proximity switch (SP)....Nov. 17 41
Reinauer & Co. (Austria)—Transistorized intercom (D)....Oct. 20 8
Renault
Automatic transfer machine (N)....Oct. 13 40
Renault with a Gia body (N)...Nov. 3 18
Republic Aviation Corp.
Space ship engine (N)....Sept. 15 37
Tap the reserve strength in metal parts. D. J. Graziano....Sept. 29 44
Republic Steel Corp. Metal Powder Div.—Iron powder parts have steel composition (N)....Sept. 22 23
Rhewum, Remscheid (Germany)—Sonic vibrating filter requires less power (N)....Sept. 22 22
Robertshaw-Fulton Controls Co. Aero Div.—Snap-action power relay with rolling springs (SP)....Aug. 11 37
Rockwell Products Corp.—Vibration-resistant fastener (SP)....Nov. 24 81
Rockwell-Standard—Liquid-cooled brakes to meet vehicle demands (D)..Nov. 17 5
Rohm & Haas—Worm feed may be largest machine part ever made of acrylic plastic (N)....July 28 12
Rollway Bearing Co. — Thrust-radial bearing (SP)....Sept. 8 36
Ronningen-Petter Co. — Quick-coupling fine filters (SP)....Nov. 24 81
Rote-Werke AG—Printing system (D)....Aug. 18 18
Royal Military College of Science (England)—Packed glands for high pressure. J. L. Thomson (DR)..Nov. 10 94
Nov. 24 74
Royal Radar Establishment—New liquid cooling techniques for airborne electronic equipment (N)....Sept. 22 21
Rubber and Asbestos Corp.—Passport to tomorrow . . . Need product diversification fast?....Dec. 29 20
Russell Mfg. Co.—Miniature gear belts (SP)....July 7 81
Scharfenberg-Polivka—Power vacuum sweeper (T)....Aug. 11 34
Schenectady Varnish Co.—Rubber-based adhesives can be made stronger (D)....Dec. 29 28
Schuhl and Von den Steinen Machine Works—Tapped nuts guide the taper (PD)....July 21 72
Scranton "Celiomatic" Battery Corp.—Car battery of new design (D)....Sept. 15 35
Sculfort-Forkedy, Vautier & Co.—"Supercap" lathe (N)....Oct. 13 40
Seneca Falls Machine Co.—Machine tool with a sense of touch (PD)..Nov. 24 69
Servomechanisms Inc.—Capacitors for the 900-F range (D)....Nov. 24 22
Short Bros and Harland Ltd.—Jet passes vertical flight test (N)....Nov. 17 19
Siemens Edison Swan Ltd.—Midget rotary selector switch (N)....Dec. 15 19
Siemens-Planiawerke AG—Heating elements made from molybdenum disilicide (D)....Nov. 3 8
Singmaster & Breyer—Design it in 3-D. H. J. Reinig....Aug. 25 22
Skogland, A. B. and Olsen Co.—Non-clogging centrifugal pumps. T. Ygge....Nov. 10 78
Smith, A. O. Corp.
Motor-starting switch (D)....Sept. 29 20
Single-phase motors enclose controls (SP)....Oct. 6 35
Socony Mobil—Octane requirements can be held down by proper choice of engine oil (D)....Aug. 4 19
Solar Aircraft Co.—One temperature for successive brazes. R. S. Mueller....Dec. 8 84
Southern California Aircraft Corp.—Electronic ballot tabulator (D)....July 7 18
Southern Research Institute—High-temperature metal performance reports from research (N)....Nov. 17 12
Southwestern Industrial Electronic Co.—Optical transducer (SP)....Dec. 15 35
Spa Vizzola (Italy)—Device indicates braking torque developed by a permanent magnet (D)....Sept. 1 20
Speco Inc.—High-temperature paint (SP)....Dec. 22 71
Sperry Gyroscope Co.
Characteristics of commercially available servo modulators. B. T. Barber (DD)....Mid-Sept. 110
Small computer leads copter to, from target (N)....Oct. 27 23
Stalwart Rubber Co.—Complex silicone sponge shapes (SP)....Aug. 25 30
Standard Motor Co.—Rollaway front end of delivery truck (N)....Nov. 17 19
Standard Oil of Ohio Automotive Engineering Div.—Higher compression ratios may increase nothing but customer complaints (D)....Sept. 29 19
Standard Telephones and Cables Ltd.
Electronic amplifier (N)....Sept. 22 21
New way to metallize ceramics (D)....Dec. 15 8
Stanford Research Institute
Crossbow tests reactor resistance to control-rod blowout (N)....Dec. 1 10
Simplified computer circuits (D)....Sept. 29 19
Will maintain classified-documents depository for AEC (N)....July 28 24
Wind tunnel to investigate the problems of high-speed flow of particle-contaminated gases (N)....Nov. 17 21
Stanley Works, Stanley Electric Tools Div.—Router (T)....Sept. 22 36
Star Carbon Mfg. Co.—Portable office duplicator (D)....Nov. 17 8
Steinzeugwarenfabrik—New ceramic resists chemical, thermal shock (N)....Aug. 4 24
Stewart-Warner Corp.—Infinitely-variable lubricant valve (SP)....Oct. 13 103
Stinson Tool and Engineering Corp.—Electric passenger car (N)....Nov. 24 27
Stromberg-Carlson—Transistor tester (D)....Nov. 17 5
Studebaker-Packard—First design look at the Lark (N)....Nov. 10 37
Surface Combustion Corp. Janitrol Aircraft-Automotive Div. — Paper-thin stainless improves heat exchanger (PD)....Oct. 13 83
Swartwout Co.—Thermal actuator positions (SP)....Nov. 3 33
Sylvania Electric Products, Inc.—First mobile digital computer (N)..Aug. 18 20
Sylvania Products, Inc. Argus Cameras Div.—Scholten, Dudley J. (PV)....July 28 33
Tapeswitch Co. of America—Switch in floor mat (SP)....Aug. 25 31
Tarim Oilfield Administration—Sandhopter car (D)....Dec. 1 8
Tavannes Machine Co.
Bench micrometer (T)....Aug. 25 26
Versatile lathe cuts tool cost (PD)....July 21 73
Teikoky Rayon—Polycarbonate fiber production (D)....Aug. 25 8
Telecomputing Corp. Data Instruments Div.—Miniature stepping motor (SP)....Dec. 29 30
Telefonaktiebolaget L. M. Ericsson—Evolution of a loudspeaker telephone. E. J. Tangerman....July 28 30
Teleregister Corp.—Airline reservation EDPM (T)....Sept. 22 36
Texas Instruments, Inc.
Silicon temperature probe (SP)..Sept. 8 36
UHF transistor to be produced commercially (N)....Dec. 15 24
Thiokol Corp. Reaction Motors Div.—Passport to tomorrow . . . A company grows . . . and splits its R&D....Dec. 29 14
Thompson Products, Inc.—Hydro-pneumatic suspension and "new concept in fuel injection" (D)....July 21 18
Titeflex, Inc.—Betley, Matthew J. (PV)....Aug. 25 28
Todco—Nickel composition plating (SP)....Oct. 20 30
Tog-Loc—Toggle in hydraulic cylinder locks (SP)....July 21 89
Ton-Tex Corp.—New belting for mechanical drives and conveyors (D).Oct. 13 35
Topp Industries, Micro-Path Div.—Pulse-counting comparator controls table movement (N)....Dec. 15 18

(A) Abstract. (D) Developments. (DD) Design Digest. (DS) Design Roundup. (Ed) Editorials.
(N) Technical News. (P) Perspective. (PD) Product Design. (PV) Points of View.
(RS) Reference Book Sheets. (SP) Significant Parts. (T) Trends in Appearance Design.

Torrington Manufacturing Co.'s Air Impeller Div.
Mixed-flow impeller (N).....Dec. 8 42
New fan design (D).....Sept. 15 36
Quieter impeller takes less power (SP) Sept. 29 59
Torrington Company, Swaging Machine Div.—The case for swaging. L. A. Whiting .....Nov. 24 70
Triplett Electrical Instrument Co.—Miniature edgewise meter (SP)...Aug. 25 31
Triplex Safety Glass Co. Ltd.—Windshield de-icer has resistance film of gold (D).....Dec. 1 8
Tuchmantel, W. (Germany)—Self-welding couplings (D).....Nov. 17 8
Tur-bo Jet Products Co.—Design better hi-temp coils for electronics (N) Sept. 15 42
Twin Disc Clutch Co.
Multiple-plate clutches (SP)...Nov. 24 81
Torque converter built for choice of circuits (SP).....Aug. 4 67
Union Carbide Corp.
Hageman, Carl H. (PV).....Sept. 8 33
High alloys to combat corrosion. E. D. Weisert (DD) .....Mid-Sept. B16
Union Carbide Corp. Bakelite Co.
Best results with phenolic molded parts. D. M. Buchanan.....Sept. 1 44
Rigid PVC plastics (SP).....Sept. 29 59
Union Carbide Corp. Linde Co.
LOX converter for B-52 (N)....Sept. 1 24
Plasma-arc plating. R. D. Stackhouse & others.....Dec. 8 104
Plasma arc process (D).....Nov. 24 22
Plasma-arc torch plating (N)....Dec. 1 17
Union Carbide Corp. Linde Co. Div. Newark Laboratory—Heyman, Robert—a salaried industrial designer and his work (T).....Dec. 15 30
Union Carbide Corp. Union Carbide Chemicals Div.—Vinyl wrinkle finish (SP) Dec. 1 31
United Engineering and Foundry Co.—How to design conveyor rolls for drive or drag. L. H. Austin..Sept. 15 78
United Mineral & Chemical Corp.—Metal alloys are liquid (SP).....July 28 34
United Shoe Machinery Co. Research Div.
Conjugate-beam method. E. D. Clark (RS) .....Aug. 18 83
How to figure deflections of elastically supported cantilever beams. T. F. Callahan (RS).....Aug. 4 63
Correction .....Sept. 15 40
U. S. Bureau of Mines
Data on vibration-damping capacity (D) .....Nov. 24 21
More power from conventional fuels (D) .....Oct. 27 19
US Dept. of Agriculture—Waxes from sugar cane (D).....Sept. 1 20
USDA New Orleans Laboratory—Tougher coatings that dry faster based on tung oil (D).....Oct. 20 5
U. S. Industries Clearing Machine Corp. Div.—Packaged punch for presses (PD) .....Dec. 22 52
U. S. Naval Ordnance Laboratory—New thermal batteries (D).....Dec. 8 38
US Naval Ordnance Lab. Non-Metallic Materials Section—How to calculate stresses in adhesive joints. H. A. Perry .....July 7 64
U. S. Naval Research Labs—High-purity lead is getting close attention (D) Dec. 15 5
U. S. Navy's Bureau of Ships
Anticorrosive coatings for metal parts (D) .....Sept. 29 20
Develops propeller for super-speed craft (N).....Sept. 15 41
U. S. Radium—Radiation-activated light sources (D).....Sept. 29 20
U. S. Rubber Co.—Passport to tomorrow . . . Hip boots for the river of words Dec. 29 11
United States Steel Corp. Applied Research Laboratory—Stress corrosion in metals. Dr. E. H. Phelps..Aug. 4 56
Universal Screw Co.—Burr-free screw (SP) .....Dec. 29 31
University of California
Develops powerful electromagnet (N) Aug. 4 24
Wind tunnel without pumps or fans (N) .....Aug. 25 19
UCLA Human Performance Lab.—Morehouse, Lawrence E. evaluates '59 cars .....Dec. 1 26
University of California Radiation Laboratory—Goodby to ammonia fumes in the print room. Haakon Johnson July 21 74
University of Delaware—Standardized method for testing insulation resistance of printed-circuit boards (D) Nov. 24 22
University of Illinois—Professor W. S. Harris says chilled-water fan-coil systems offer low-cost route to central air conditioning (D).....Sept. 29
University of Marburg (Germany)—New process for separating isotopes (D) Nov 17 8
University of Wisconsin—Plastics: where vacuum forming stands today. R. L. Daggett .....Dec. 22 56
Vaculite Corp.—Metallized paper, competitive in price (D).....Sept. 1 19
Valvair Corp.—Ball cam-actuated valve (SP) .....Sept. 15 105
Van Doorne Automobielfabriek NV—Small car (D).....Oct. 20 8
Van Norman Machine Co.—Storm, J. E. (PV) .....July 28 33
Varian Associates—High vacuum produced by ion pumps (N).....Nov. 17 10
Velectra of Bienne (Switzerland)—Transistorized amplifier (D).....Nov. 3 8
Viaud Associates—French design—hydraulic press; ore crusher (T) Sept. 8 35
Vibriplasticarr (Italy)—Trim 88-lb plastic body for sports car (N)...Oct. 13 38
Vickers, Inc.—Constant-speed hydraulic drives (D) .....Oct. 27 20
Reveals liquified-gas motor (N)..Dec. 1 18
Victor Adding Machine Co.—Flat-bed truck (T) .....Aug. 11 34
Viking Mfg. Co.—Straightedge for highways (PD) .....Nov. 10 82
Vitro Corp.—Metal-ceramic coating process (D) .....July 28 5
WADC Wright-Patterson AFB—Improved atmospheric equipment needed for manned space flight (N).....Oct. 13 41
Wall Colmonoy Corp.—New design standards for brazed joints and tool steels (D) .....Sept. 1 19
Wall Colmonoy Corp. Stainless Processing Div.—Metal alloy finish (SP).Oct. 20 30
Wallace & Tiernan, Inc.
Cantilever springs that roll with the load. J. D. Howell.....July 7 58
Dual bourdon-tube gages (SP)..Nov. 17 41
Westchester Technical Corp.—Linkage joints. Ho Chow .....Dec. 8 87
Westinghouse Air Brake Co. Industrial Products Div.—Pneumatics: safeguarding the air supply. E. L. Holbrook .....Sept. 29 48
Westinghouse Electric Corp.
Computers speed design of high-frequency equipment (N).....Sept. 1 25
Debugging—that last step in design. D. C. Cumming.....Sept. 15 92
Power station on the moon (N) .Sept. 29 22
Westinghouse Electric Corp. Atomic Equipment Dept.—Stress in flat-ended pressure cylinders. E. J. Cattabiani (RS) .....Dec. 8 111
Westinghouse Electric Co. Materials Engineering Dept.—Statistics build precision and economy into material specifications. Sheppard & Ginsberg Aug. 18 75
Westinghouse Electric Corp. Micarta Div.—Extruded polyethylene plate (SP) Nov. 10 101
White Sewing Machine Corp.—Gehling, John A. (PV) .....Aug. 25 29
White Sewing Machine Corp. Apex Reinforced Plastics—Plastics hurl US Navy torpedoes (PD).....Nov. 10 80
Willor Mfg. Corp. Camblock Corp. Div.—Quarter-turn connects terminal block (SP) .....Oct. 20 30
Willys Motors, Inc.—Mechanical mule is lightweight—but muscular (PD) Sept. 29 42
Wollensack Optical Co.—Prestressed spring drives camera aid (PD) July 7 60
Worthington Corporation
Basic principles of mechanical seals. T. J. Sniffen (DD).....Mid-Sept. F12
Selection and application of heavy-duty air compressors. R. Schaefer (DD) .....Mid-Sept. J12
Wright Air Development Center
Coatings that will insulate electrical wire (D) .....Nov. 10 35
Liquid structure based on the molecular theories (N) .....Sept. 8 10
Pigments protect products from heat, light, ozone (N).....Oct. 20 11
Yuba Research and Development Center—Adjustable pressure transducer (SP) July 21 89

(A) Abstract. (D) Developments. (DD) Design Digest. (DS) Design Roundup. (Ed) Editorials.
(N) Technical News. (P) Perspective. (PD) Product Design. (PV) Points of View.
(RS) Reference Book Sheets. (SP) Significant Parts. (T) Trends in Appearance Design.

AUTHORS' INDEX

ADAMS, Clarence R.—Step bearing—a new concept in air lubrication..Dec. 8 96
ALEXANDER, L. W.—Additives strengthen sintered nylon parts Sept. 15 86
ALLEN, Howard G.—More work for the busy staple .....Dec. 8 108
AMBLER, E. C.—Point of view...Dec. 15 33
ANDERSON, Merwin T.—How to make sound tests at 150 db.....Dec. 22 58
AUSTIN, Laurence H.—How to design conveyor rolls for drive or drag Sept. 15 78
BAGNARD, G. M.—Charts find torque pressure loss of swivel joints..Dec. 22 67
Designing with swivel joints....Dec. 8 100
Swivel joints may work where no-hunz else can .....Aug. 4 40
BARBER, Basil T. & L. S. Klivans—Characteristics of commercially available servo modulators.Mid-Sept. I10
BAREISS, R. A. & P. A. Brand—Which type of torque-limiting device? Aug. 4 50
BEHRENS, M. D. & others—Rumble in single-cylinder engines ....Mid-Sept. H2
BELL, Robert S.—Point of view...Aug. 25 29
BERKELEY, F. Duncan—Ejectors for suction pressure .....Mid-Sept. J2
BETLEY, Matthew J.—Point of view Aug. 25 28
BLODGETTT, Norman S.—Point of view Sept. 22 38
BOGGS, W. E.—Build a model shop Oct. 13 74
BOUTON, G. M. & P. R. White—Soldering aluminum—a simple fluxless technique .....Mid-Sept. G10
BOYLE, Ruth R. & Robert C. May—More service from your company library .....Oct. 13 72
BRAND, P. A. & R. A. Bareiss—Which type of torque-limiting device? Aug. 4 50
BROWN, Charles E.—Point of view Sept. 22 38
BUCHANAN, David M.—Best results with phenolic molded parts..Sept. 1 44
CAIRNS, R. E. Jr. & J. L. Ham—Manganese joins aluminum to give strong stainless .....Dec. 22 50
CALLAHAN, T. F.—How to figure deflections of elastically supported cantilever beams .....Aug. 4 63
CALLINAN, T. D.—Glass and ceramic fibers—they beat the heat...July 7 70
CARSON, Robert W.—New hardenable titanium .....July 21 68
What you need for a better engineering laboratory .....Oct. 13 66
CATTABIANI, Eugene J.—Stress in flat-ended pressure cylinders.....Dec. 8 111
CHAPIN, Roy D. Jr.—Point of view July 28 32
CHENEY, A. J. & W. E. Ebeling—Mechanical joining of plastics.Mid-Sept. G2
CHERRY, W. T.—Applications of sprag-type clutches .....Mid-Sept. E18
CHIRONIS, Nicholas—For today's draftsman, these modern tools....Oct. 13 68
CHORAFAS, Dr. Dimitris N.—What you should know about designing for reliability .....Nov. 10 76
CHOW, Ho—Linkage joints.....Dec. 8 87
CHRISTENSEN, Paul M.—Point of view Sept. 8 33
CLARK, Dudley B.—Point of view Sept. 22 39
CLARK, E. D.—Conjugate-beam method Aug. 18 83
CLAUSEN, Hugh—Engineering design Sept. 1 38
COLAO, J. J. & M. M. Gurvitch—Comparison of phenolic and polyester premix materials .....Mid-Sept. C12
COLLINS, J. A. & others—Fretting-fatigue failure of titanium-steel and steel-steel joints .....Mid-Sept. F15
CRAM, Harkness W.—A look at wire inserts .....Sept. 29 55
CRANSTON, W. E.—Point of view Dec. 15 33
CREMER, G. D. & R. S. Mueller—One temperature for successive brazes Dec. 8 84
CROOKS, Robert G.—Making money with patents is tough—but not impossible Nov. 3 24
CROSS, Ralph E.—Point of view..Nov. 3 30
CUMMING, Donald C.—Debugging—that last step in design.....Sept. 15 92
CUTLER, Julius—Point of view..Sept. 22 39
DAGGETT, Ronald L.—Plastics: where vacuum forming stands today Dec. 22 56
DELMONTE, John—Relationship between properties of epoxy resin Mid-Sept. C5
DEROSS, Alan B.—High strength of aluminum alloy .....Mid-Sept. H6
DRAGE, H. D.—For measuring RPM—which tachometer? .....Nov. 10 89
DRIESCH, Theodore W.—Considerations for friction materials.....Mid-Sept. C16
DUTCHER, J. L. & Murray Rosenblatt—Numerical control .....Oct. 27 50
EARLY, J. M.—Operation of the intrinsic-barrier transistor .....Mid-Sept. I14
EBELING, W. E. & A. J. Cheney—Mechanical joining of plastics.Mid-Sept. G2
FENG, Tsun-Ying—Steady-state axial flow forces on pneumatic spool-type control valves .....Mid-Sept. J9

FISHER, Thomas E.—Point of view Sept. 22 40
GAIENNIE, Bernard—Point of view Nov. 3 31
GARDNER, Annesta R.—Electroluminescence—new area-source of light Sept. 15 74
Heavy metal solves weighty problems July 21 62
GEHLING, John A.—Point of view Aug. 25 29
GERSTIN, Harry—Best recipe for casting urethane foam .....Nov. 10 86
GIEDT, W. H. & D. L. Rall—Temperature measurement in solids..July 21 65
GILBERT, Horace D.—Point of view Nov. 3 30
GINSBURG, H. & H. R. Sheppard—Statistics build precision and economy into material specifications...Aug. 18 75
GLASER, P. E.—Application of solar furnaces .....Mid-Sept. A14
GRAZIANO, Dominic J.—Tap the reserve strength in metal parts.....Sept. 29 44
GUIDOTTI, A. E. & others—Plasma-arc plating .....Dec. 8 104
GURVITCH, M. M. & J. J. Colao—Comparison of phenolic and polyester premix materials .....Mid-Sept. C12
HAGEMAN, Carl H.—Point of view Sept. 8 33
HAM, J. L. & R. E. Cairns Jr.—Manganese joins aluminum to give strong stainless .....Dec. 22 50
HAMM, H. W.—Bearing heat and dissipation charts .....Mid-Sept. F10
HASTINGS, George S.—Point of view Oct. 20 29
HINKLE, R. & I. E. Morse—Design of helical springs for minimum values Mid-Sept. F4
HINKLE, R. T.—Roberts' law helps you find alternate four-bar linkages Oct. 27 54
HOFFMANN, T. R.—Curve fitting Mid-Sept. A15
HOLBROOK, E. L.—Pneumatics: safeguarding the air supply.....Sept. 29 48
HOWELL, John D.—Cantilever springs that roll with the load.....July 7 58
HUNSAKER, O. K.—Pearlitic malleable castings .....Mid-Sept. D7
IVERSON, F. Kenneth & M. A. Pohlman—New super alloy bids for hot jobs July 21 76
JASS, J. E.—Point of view.....July 28 32
JOHNSON, Haakon—Goodbye to ammonia fumes in the print room July 21 74
JOHNSON, L. W.—Vacuum gives top-quality metals .....Aug. 18 72
KAPLAN, Joseph—Whip the backlash in spring clutches .....Aug. 18 62
KAUFMAN, Edgar— . . . Evaluate '59 cars .....Dec. 1 26
KAYE, S. Warren—Edge area of bent-up shapes—k-factor will speed answer Sept. 15 101
KELLEY, Oliver K.—Operating principles of fluid couplings.....Mid-Sept. E15
KLIVANS, L. S. & Basil T. Barber—Characteristics of commercially available servo modulators.....Mid-Sept. I10
KOCK, Dr. Winston E.—Point of view Oct. 20 28
KOGAN, ZUCE—Pre-development planning: four steps to low-risk products Aug. 11 32
KOLB, John & Raymond Spilman—Designing a product—then and now Oct. 20 26
KOLLI, Robert— . . . Evaluate '59 cars Dec. 1 26
KRAUSE, Irvin & Bernard W. Shaffer—Method of finite differences..Oct. 13 77
KUSMISS, Irene—Curves find bending and torsion strength of thin-walled cylinders .....July 21 85
Curves find compression strength of thin-wall cylinders .....July 7 77
LANGLIE, H. J.—Numerical control and the design engineer.....Oct. 20 23
LEAHY, S. F.—Point of view.....Sept. 8 32
LIBBY, Charles C.—Guide to selecting polyphase motors .....Aug. 18 58
LOCKE, Walter J.—Microfilm pushes drawings aside .....Oct. 27 44
LOEWY, Raymond— . . . Evaluate '59 cars .....Dec. 1 26
LORIA, Edward—7 closer looks at metal properties .....Oct. 27 48
LOUIS, Victor—Invention in the USSR Nov. 17 33
MACKINNON, W. R.—Name plates for prototypes .....Oct. 13 88
MAIER, Dr. K. W.—Chart analyzes sinusoidal motion .....Nov. 24 77
Drum camera best way to put motion on record .....July 21 78
Springs that store energy best..Nov. 10 71
MAINE, A. E.—Calculate gyroscope precession torques (DD).....Mid-Sept. H8
MARCO, S. M. & others—Fretting-fatigue failure of titanium-steel and steel-steel joints .....Mid-Sept. F15
MARTIN, L. D.—New standards for gears span wide range of quality..Dec. 22 46
MAY, Robert C. & Ruth R. Boyle—More service from your company library Oct. 13 72
McPHERSON, Dr. J. H.—Are you creative?—ask your wife.....Nov. 17 28
MICHELSON, Stanley & George A. Peters—Research management . . . a problem in personalities.....Sept. 8 30
MILLER, Austin R.—Point of view Sept. 22 39
MILLER, J. C.—Diesel engine fuel economy .....Mid-Sept. H9
MILLS, E. B. & J. E. Petermann—Limited end float couplings for motor applications .....Mid-Sept. E6
MITCHELL, O. V.—Point of view Oct. 20 28
MOORE, B. C.—Estimations of resonant frequency of hydraulic actuators Mid-Sept. J5
MOORE, William H.—More surface polishing . . . less galling.....Nov. 24 63
MOREHOUSE, Lawrence E.— . . . Evaluate '59 cars.....Dec. 1 26
MORGAN, Norman L.—Before selecting a fhp motor.....Dec. 22 60
MORSE, I. E. & R. Hinkle—Design of helical springs for minimum values Mid-Sept. F4
MOSHER, R. G. & others—Rumble in single-cylinder engines .....Mid-Sept. H2
MUELLER, R. S. & G. D. Cremer—One temperature for successive brazes Dec. 8 84
NIEMANN, E. A.—How to find the diameter for true involute form Oct. 27 65
NORTH, Dr. Harper Q.—Point of view Sept. 8 33
NOY, Peter C.—For better electroplating July 7 74
OGDEN, H. R.—Titanium at temperature Mid-Sept. B2
OLIVETTI, Dino— . . . Evaluates '59 cars .....Dec. 1 26
PARET, Richard E.—The right finishes for stainless steel.....Oct. 13 99
PARK, Ford R.—Magnetic-force welding Sept. 15 82
Passport to tomorrow's new products Dec. 29 5
Three new rough, rigid thermoplastics: a comparison .....Sept. 29 36
PERELLE, Charles W.—Point of view Aug. 25 28
PERRY, H. A.—How to calculate stresses in adhesive joints....July 7 64
PETERMANN, J. E. & E. B. Mills—Limited end float couplings for motor applications .....Mid-Sept. E6
PETERS, George A.—Selector-switch knobs .....Dec. 8 103
PETERS, George A. & Stanley Michelson—Research management . . . a problem in personalities.....Sept. 8 30
PHAIR, R. J.—Conductive and resistive coatings .....Mid-Sept. D8
PHELPS, Dr. E. H.—Stress corrosion in metals .....Aug. 4 56
PIERCE, William E.—New look in porcelain enamel .....Nov. 24 53
POHLMAN, M. A. & F. Kenneth Iverson—New super alloy bids for hot jobs July 21 76
PROBERT, Ralph—Money-saving electromagnetic relays .....Nov. 24 66
PROUTY, R. G.—Flat belts for adjustable-pitch pulleys .....Oct. 27 59
PRUGH, T. A.—Switch-time nomograph Mid-Sept. I19
RABINOW, Jack—Point of view..Oct. 20 29
RABINOWICZ, Ernest—New techniques revealed at West Coast lubrication conference .....Nov. 10 84
RALL, D. L. & W. H. Giedt—Temperature measurement in solids..July 21 65
REINIG, Henry J.—Design it in 3-D Aug. 25 22
RICE, Willard H.—Point of view.Sept. 22 38
ROBBINS, F. A. & R. D. Taber—Plastic piston rings for nonlubricated applications .....Mid-Sept. F7
ROBINSON, J. A. & others—Rumble in single-cylinder engines ...Mid-Sept. H2
ROSENBLATT, Murray & J. L. Dutcher—Numerical control .....Oct. 27 50
ROTH, G. L.—Modifying valve characteristics .....Mid-Sept. J6
RUZICKA, Jerome E.—How much stress on a bearing ball?.....Nov. 10 97
RYDER, G. H.—Design of belt and wire rope drives .....Mid-Sept. E10
SCHAEFER, R.—Selection and application of heavy-duty air compressors Mid-Sept. J12
SCHIFFERLI, L. M. Jr.—Slip casting . . . its field broadens.....Oct. 13 84
SCHOLTEN, Dudley J.—Point of view July 28 33
SCHUETTE, E. H.—How to calculate stresses in press-fit bushings..Sept. 1 51
SCHWARZ, Edward R.—Design of experiments .....Sept. 22 34
SHAFFER, Bernard W. & Irvin Krause—Method of finite differences..Oct. 13 77
SHEPPARD, H. R. & H. Ginsburg—Statistics build precision and economy into material specifications...Aug. 18 75
SHIPLEY, Eugene E.—Gear failures related to lubricants.....Mid-Sept. E2
How to predict efficiency of gear trains Aug. 4 44
SMITH, C. R.—A tonic for tired metal—Why have fatigue problems when it's easier to do without them?...Dec. 1 22
SMITH, R. W.—Those heavy presses can pay off .....Sept. 29 34
SMOLEY, E. M.—Flange design and gasket selection .....Mid-Sept. F2
SNIFFEN, T. J.—Basic principles of mechanical seals .....Mid-Sept. F10
SPILMAN, Raymond & John Kolb—Designing a product—then and now Oct. 20 26
STACKHOUSE, R. D. & others—Plasma-arc plating .....Dec. 8 104
STARKEY, W. L. & others—Fretting-fatigue failure of titanium-steel and steel-steel joints .....Mid-Sept. F15
STEVENS, Brooks— . . . Evaluates '59 cars .....Dec. 1 26
STEVENS, Robley D.—Overtime pay for engineers? .....July 28 29
STEWART, G. C.—Point of view..Dec. 15 32
STOLP, Jack—Optical projectors for engineering, research, development Mid-Sept. A5
STORM, J. E.—Point of view....July 28 33
STRASSER, Federico—14 adjusting devices .....Oct. 27 62
14 indexing devices.....Sept. 1 48
14 special-purpose bearings....Oct. 13 96
16 universal shaft-couplings...Aug. 18 80
13 handy level mechanisms....Sept. 15 98
13 ways to couple shafts.....Aug. 4 60
20 simple locking devices.....Dec. 22 64
STUGARD, Carl F.—Point of view Nov. 3 31
SUNDBERG-MONTY FERAR, Carl— . . . Evaluates '59 cars.....Dec. 1 26
TABER, R. D. & F. A. Robbins—Plastic piston rings for nonlubricated applications .....Mid-Sept. F7
TANGERMAN, E. J.—Bellwether with wings .....July 7 52
Engineering in Europe.....Sept. 1 32
Evolution of a loudspeaker telephone July 28 30
TEAHUR, Walter Dorwin— . . . Evaluates '59 cars.....Dec. 1 26
THOMAS, D. G.—Engine exhaust system noise control .....Mid-Sept. H14
THOMSON, J. L.—Packed glands for high pressure .....Nov. 10 94
Nov. 24 74
TUNSTALL, John—Britain's new variable speed motor.....July 7 68
TUTT, Charles L. Jr.—Industrial report preparation and evaluation..Mid-Sept. A2
VIENOT, Jacques—French design..Sept. 8 34
VON LUDWIG, Davidlee—The little man can't protect his patents.....July 28 26
WADE, Worth—Foreign patents—nuisances or nuggets.....Dec. 15 27
WALTON, James C.—Silicone rubber sponge .....Aug. 4 54
WEISERT, Edward D.—High alloys to combat corrosion .....Mid-Sept. B16
WHITE, P. R. & G. M. Bouton—Soldering aluminum—a simple fluxless technique .....Mid-Sept. G10
WHITING, Lloyd A.—The case for swaging .....Nov. 24 70
WILLIAMS, Harry A.—Point of view Dec. 15 32
WILLIS, R. J. Jr.—How many planets in an epicyclic gear?.....Nov. 24 57
WILSON, I. J.—Forming titanium extrusions .....Mid-Sept. D2
WOLFE, John K.—Point of view..Sept. 8 32
YEAPLE, Franklin D. Jr.—Fluid power for machine-tool controls...Aug. 18 70
Here's help in selecting the right motor Oct. 13 86
Immersed motors .....Sept. 15 80
YENNI, D. M. & others—Plasma-arc plating .....Dec. 8 104
YGGE, T.—Non-clogging centrifugal pumps .....Nov. 10 78
ZIEBARTH, Hans—Small gas turbine Aug. 4 38
ZEISS, Carl Works—Light replaces heating instrument (PD).....Nov. 24 62